The Newspaper of Information Systems Management
July 25, 1994, Vol. 28, No. 30, 144 Pages, $6/Copy, $48/Year

COMPUTERWORLD

Surmounting client/server application walls. See CW Guide page 91.

Pathworks loses steam

By Mary Brandel

Digital Equipment Corp.'s Pathworks may have a future at customer sites, but in many cases it will not be as a strategic network operating system.

Five users out of the seven interviewed last week said they plan to migrate away from Pathworks to either Microsoft Corp.'s Windows NT Advanced Server or Novell, Inc.'s NetWare.

Most said they would keep Pathworks to provide services such as TCP/IP transports or VAX/VMS access.

Bridgeport Hydraulic Co. in Connecticut is typical. "We're using [Pathworks] more as middleware," said Dave Yakerson, a network administrator. Pathworks was brought in to the company to give NetWare users access to VAX/VMS files. But now, "We're dumping the VAX for RS/6000s," Yakerson said.

Pathworks, *page 133*

Editorial

The mouths that roared

Assistant Attorney General Anne K. Bingaman and her boss, Janet Reno, must be sore by now from patting themselves on the back following their settlement with Microsoft. They say the settlement "levels the playing field and opens the door for competition." This duo "beat the pants off" that rascally, bespectacled nerd from Redmond, Wash. Microsoft "capitulated."

Actually, their words pretty much sum up the result of four years of government investigation into Microsoft's business practices, and the sum is this: political, face-saving rhetoric.

Editorial, *page 36*

Newspaper

Decree: Deal or dodge?

By Stuart J. Johnston
REDMOND, WASH.

ANTITRUST SETTLEMENT

See additional stories on pages 14 and 15 ▸

There will be little effect on business-as-usual for Microsoft Corp.'s customers after the settlement of a long-running antitrust investigation, largely because the government came away pretty empty-handed.

That was the clear consensus of users and other observers last week, some of whom were openly critical of the U.S. Department of Justice.

Last week's deal addresses only part of what Microsoft foes had hoped for and leaves untouched key issues such as the lack of separation between the systems and applications halves of the Microsoft business.

"I can't conceive of any of my clients caring" about the settlement, said Bill Cornfield, president of the Windows Support Group, a New York-based consultancy whose clients include Anheuser-Busch Cos., the Federal Reserve, the National Football League and the National Basketball Association.

"It is clearly a very weak opinion in light of the opportunity to expand competition in an extremely vital segment of the computer industry," said one chief information officer who requested anonymity. "The separation of the operating system and applications [businesses] should have been mandated. It would have encouraged a much stronger, richer and broader offering of applications packages."

In fact, some observers said the greater victory for Microsoft was the narrow scope of the consent decree. However, the decree does not prevent future investigations into some of the company's other business practices.

"It was an underwhelming result," said Peter R. Tierney,

Decree, *page 14*

Adversaries claim justice served

DOJ insists Microsoft capitulated

Tough-talking Anne K. Bingaman, assistant attorney general for antitrust at the U.S. Department of Justice, spoke with *Computerworld* Senior Editor Mitch Betts last week and defended the department's handling of the case against Microsoft Corp.

Q: What's your reaction to industry perception that this is a "hollow victory" for the government?

A: That's garbage. Microsoft fought this thing bitterly through three huge government investigations — the Federal Trade Commission, us and the European Commission — for four and a half

Bingaman, *page 15*

KATHERINE LAMBERT

Anne K. Bingaman: *'Of course Microsoft is going to say it's nothing; what else are they going to say? That 'Bingaman beat the pants off us?' '*

Gates denies any illegal behavior

ALAN LEVENSON

Bill Gates: *'Microsoft is very proud of the way it does business and its success, and we're looking forward to more success [in the future].'*

Microsoft's Chairman Bill Gates and General Counsel Bill Neukom last week briefed the press on the antitrust settlement and responded to a number of questions, including the following:

Q: How does it feel to have the attorney general get up in front of the whole world and say you have been doing some illegal things?

Gates: In no way does Microsoft believe that it's ever done anything that is at all inappropriate or illegal. And the Department of Justice chose, based on the signing of this consent decree, not to go forward with a lawsuit, which would

Gates, *page 15*

Relational databases

Per-user pricing plans may disappoint

By Kim S. Nash

New per-user pricing schemes for big relational databases may frustrate customers looking to save money over more complicated price structures, users and analysts said last week.

Database heavy hitters Oracle Corp. and Informix Software, Inc. have ditched complex pricing based on size of hardware, number of users and brand of operating system for simpler per-user price tags. This was done in part to appease potential customers starry-eyed over cut-rate database deals from Microsoft Corp. [CW, June 27].

The bigger they are . . .

However, per-user pricing does not buy users much. In fact, some shops could end up paying more under the plan, depending on nuances in how database makers define "user." Large client/server deployments could really take a hit, observers said.

"Users assume that per-user pricing will

Per-user prices, *page 133*

Microsoft's database does not offer per-user pricing. Four different options are available:

- Single-user for $995.
- Two- to 10-user workgroup level for $2,995.
- Eleven- to 64-user departmental group for $7,995.
- Enterprise version with unlimited users for $14,995 or $19,995.

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What's Inside

July 25, 1994

CLIPPER CONTROVERSY

SOUNDOFF!

KATHERINE LAMBERT

WEITZNER: CON CLIPPER

To the Electronic Frontier Foundation's Daniel J. Weitzner, the Clipper encryption chip is Big Brother encroaching on your privacy. That's poppycock, counters Dorothy Denning, a cryptography expert. See In Depth, page 105 and related news story, page 4.

JEFFERY NEWBURY

DENNING: PRO CLIPPER

NEWS

- When Microsoft rolls out its **Hermes** systems management product, it initially will do so in a limited release to certified resellers. *Page 4*
- Users can look forward to a wave of **systems management** software releases that will allow them to combine administration of Windows NT and Unix servers. *Page 4*
- **LAN messaging** vendors make headway in ensuring that products can interoperate. Page 6
- Sun will promote **Unix servers** as links between PC LANs and mainframes. *Page 6*
- Users say **NetWare 4.02** isn't perfect, but it is reassuring. *Page 7*
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- **Compaq**'s enterprise strategy attempts to ride **Oracle**'s database technology. *Page 10*
- IBM plans to support **System/36**'s SSP operating system on upcoming PowerPC-based **AS/400** models. *Page 12*
- **Digital Equipment** lays out more details on its corporate redesign and sells off its storage unit. *Page 12*
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- **OLE 2.0** development is tough, but help is in the offing. *Page 77*

CW GUIDE

- If your applications are hitting a wall in terms of performance, you may need a new **client/server development platform**. Consultant Judith Hurwitz provides a prescription to relieve this problem. Firing Line user reviews reveal that the latest tools from KnowledgeWare and Bachman are improved but still show signs of transition. Buyers' Satisfaction Scorecard survey gives high marks to Visual Basic but lower ratings to market leader PowerBuilder. *Page 91*

CAREERS

- **NetWare 4.x** requires a major reorientation for administrators. *Page 108*

MARKETPLACE

- Despite bad experiences, some companies are not opposed to farming out **client/server development projects** but plan to choose their consultants better. *Page 121*

COMMENTARY

- **Bill Laberis** says the Microsoft settlement was little more than political face-saving for the federal government. *Page 1*
- **Ben Rothke** suggests that it is time to stop the upgrades long enough for users to master what they already have. *Page 37*
- **Patricia Seybold** advises that you can make telecommuting work — with time and communication. *Page 37*
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Executive Briefing

A look at a typical day for an IS executive such as Mary Jo Greil at International Paper can unearth some valuable lessons in managing organizational change. A sampling: Being a successful leader means looking at every conversation as an opportunity and every snafu as a challenge and knowing that you can never spend too much time encouraging your staff. *Page 82*

Customers should feel little impact from Microsoft's settlement with the U.S. Department of Justice on antitrust allegations, observers said, largely because the government came away pretty empty-handed. While the settlement addressed issues of royalties on Windows sales by OEMs, it leaves untouched key issues such as the lack of separation between the systems and applications halves of the Microsoft business. *Pages 1, 14 and 15*

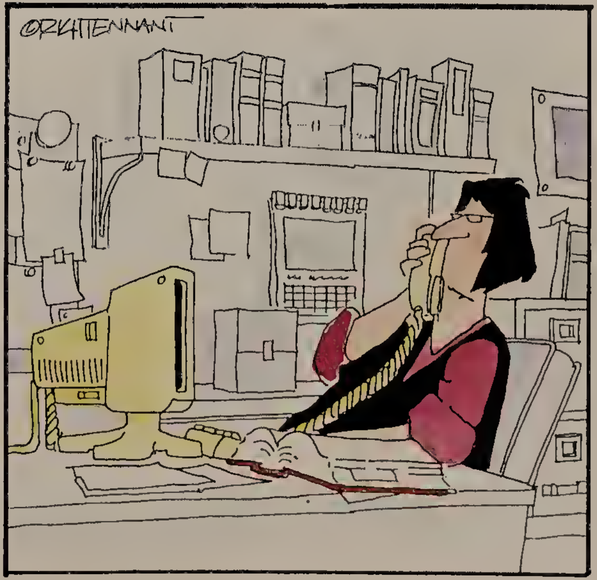
New per-user pricing schemes for big relational databases may disappoint users looking to save money over more complicated price structures. In fact, some shops could end up paying more under the plan, depending on nuances in how database makers define "user." Large client/server deployments could really take a hit, observers said. *Page 1*

JC Penney will spend $12 million to upgrade its nationwide store network, in part by migrating off an IBM SNA architecture to a peer-to-peer network using TCP/IP. The contract with AT&T Global Information Solutions will enable JC Penney to develop a client/server-based network for all its 1,242 stores. The mammoth retailer will also upgrade its in-store computers, servers and back-office applications. *Page 20*

Wireless communication technology could take charge to prevent a tragedy on the nation's rail system. Safety experts say the railroad industry's efforts at creating a fail-safe computer system have moved too slowly. Now, the Federal Railroad Administration may require a system that would allow officials in control centers to take the reins of a locomotive in an emergency situation. *Page 24*

IRS employees snooping into citizens' personal affairs has Congress upset. Sen. John Glenn and members of the Governmental Affairs Committee of which he is chairman expressed outrage at the number of IRS workers suspected of violating security and privacy in the primary computer system used to process tax returns. *Page 28*

The 5th Wave *by* Rich Tennant



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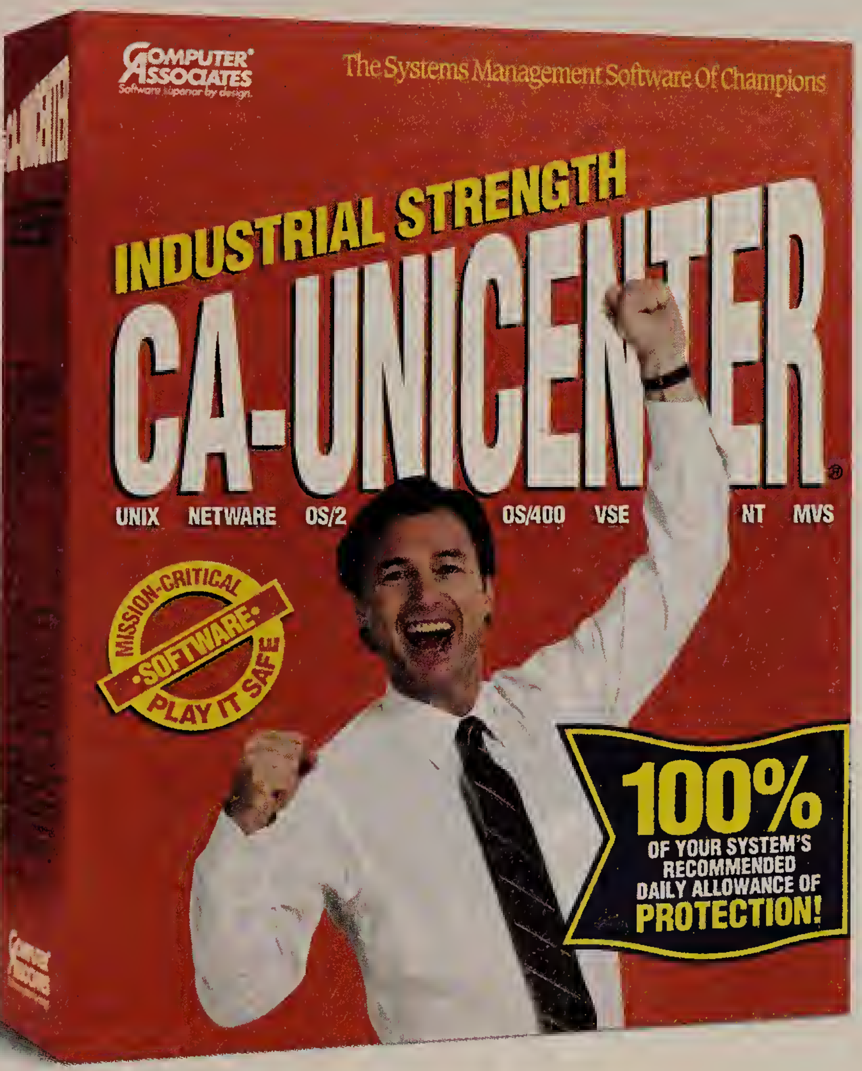
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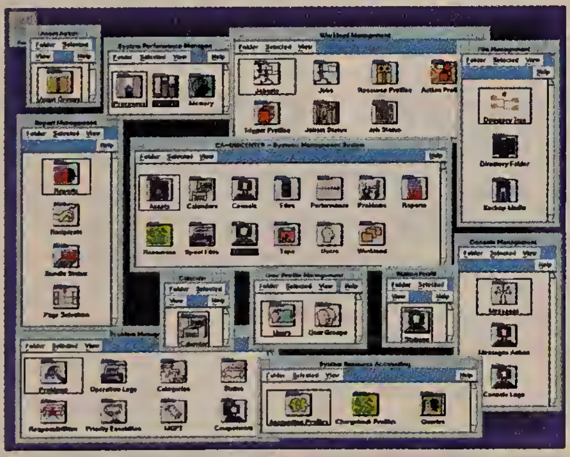

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Systems management

Some resellers will get Hermes

By Stuart J. Johnston
and Ed Scannell
REDMOND, WASH.

First, the good news: Systems managers do not have much longer to wait for Microsoft Corp.'s Hermes systems management tool.

However, from its October release until January, Microsoft will restrict sales of the Systems Management Server (SMS), code-named Hermes, to authorized resellers who have been certified to sell, install and support the product.

Meanwhile, many users are anxious to get a hold of the product. Microsoft has promised it will greatly reduce the time spent inventorying PC software and hardware and installing and standardizing PC software companywide.

"We have a lot of eggs in the Hermes basket in terms of our future strategic direction," said Art Tisi, chief information officer at the Metropolitan Museum of Art in New York.

Microsoft officials said last week that 25 authorized training centers began offering certification courses on SMS at the beginning of the month. Certified Microsoft Solution Providers have exclusive rights to sell SMS until January.

Complex product

However, officials and resellers said the limits on who could initially sell Hermes is mostly due to the product's complexity and need for expert support.

"It's a concept that's alien to a lot of people, [and Hermes] is going to require somebody to help them get it installed," said Bill Cornfield, president of the Windows Support Group, a New York consultancy.

Cornfield added that he did not expect Microsoft's insistence that Hermes be sold only by certified firms would cause any bottlenecks for prospective users.

Hermes will ship within 30 days after Windows NT 3.5, said Rich Barth, the Windows NT product manager responsible for SMS. Windows NT 3.5, code-named Daytona, which Microsoft officials have promised will ship in both server and workstation versions by the end of September, is needed to run SMS.

Among a plethora of new details that Microsoft divulged last week, the software distribution and hardware inventory system will eventually add the licensing server that the company has promised to deliver.

Database in control

SMS reaches out over the network to query information in a database maintained by a client component on each user's PC. This internal database, called the registry, keeps track of software and many details of the hardware installed in a system.

Microsoft will provide client software for MS-DOS, Windows, Windows for Workgroups and Windows NT as well as for the Macintosh and, perhaps surprisingly, for IBM OS/2-based computers.

Additionally, SMS will automatically propagate its client software over the network to any machine that does not already have it.

Powerful product

And when it is combined with enhanced information available through the Plug and Play capabilities coming in Microsoft's Chicago update to Windows, SMS will become even more powerful, users and resellers said.

"We like Chicago because of its implications for LAN and network management stuff and distributing applications using the registry," said Warren Smith, a certified public accountant in the auditing services department at Pacific Bell in San Ramon, Calif. "You can suck that data right up to Hermes."

The promise that everyone hopes Hermes will live up to is one that corporate financial officers have increasingly mandated on information systems staffs in recent years: Do more with less. In this case, Hermes will reduce the amount of time needed to perform systems audits and provide help desk and software installation services, users said.

Hermes' features

- HARDWARE AND SOFTWARE INVENTORY
- SOFTWARE DISTRIBUTION
- PERFORMANCE ANALYSIS
- TROUBLESHOOTING

Unix, NT links to ship in 1995

By Jean S. Bozman
BURLINGAME, CALIF.

■ **Users will be able to centrally manage both Unix servers and Microsoft Corp. Windows NT servers with a new wave of software expected to ship next year.**

Software to manage NT is expected from Tivoli Systems, Inc. by year's end and OpenVision in 1995, as Tivoli Chief Executive Officer Frank Moss and OpenVision CEO Mike Fields told last week's Technologie Partners' Network Outlook conference here. Both Tivoli and OpenVision already sell separate systems management suites for Unix servers.

A late 1994 NT-compatible release is also expected from Computer Associates International, Inc., which first announced NT support for its Unix-based CA-Unicenter package last April. Other vendors are expected to join in as users install more production Windows NT servers, analysts said last week.

Unix, NT living together

Users who already have NT and Unix systems see a growing need for combined systems management tools. "Our environment is heterogeneous, and it will continue to be," said Tsvi Gal, a vice president of information technology at Wells Fargo Bank NA in San Francisco. "We foresee Unix and NT living together on the same network, and having a single point of management will just make sense."

Without a unified systems management console, it will be tougher to track user log-ons, system security and site licenses as well as distribute software application releases throughout an enterprise. "We would support the use of this type of software approach to minimize swivel-chair systems management," said Bill Estrem, project leader of 3M Co.'s information architecture group in St. Paul, Minn.

On the other hand, Microsoft's Hermes systems management software did not originally support Unix — and still does not do so directly. Instead, Microsoft partner Digital Equipment Corp. is creating software agents that will allow NT servers to access data from a variety of Unix servers (see related story at left).

Without that Hermes-compatible extension, users must set up side-by-side consoles for Hermes and Unix. "The open systems environment is forced with so many different suppliers and so many different products that the costs and complexity have gotten totally out of hand," said Peter Kastner, a vice president at Aberdeen Group in Boston.

Demand for combined systems management will grow as NT servers gain momentum for production applications. "NT and Unix compete in the same space," said David Smith, director of International Data Corp.'s Advanced Operating Environment service. "People are evaluating or looking at NT in addition to, or as a potential replacement for, Unix."

Unify it

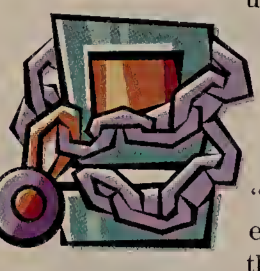
Systems management software can unify support for NT and Unix servers on the same console. Tivoli Management Environment 2.0 will build on Microsoft's Hermes application programming interface as will OpenVision's NT-compatible package. CA's CA-Unicenter can work without Hermes — and relies on its own agents to carry system status data to the console. Meanwhile, Digital is developing agents that will allow Hermes to access data from Unix servers.

Encryption standards

Feds seek Clipper alternative

By Gary H. Anthes
WASHINGTON

The Clinton administration last week called on the industry to develop an alternative to the controversial "Clipper" encryption standard for data communications.



Clipper opponents called the appeal a major victory, but the White House said its encryption objectives, outlined in a letter to Rep. Maria Cantwell (D-Wash.), had not changed fundamentally.

The Clipper chip uses a secret encryption algorithm and two encryption/decryption keys maintained in escrow by separate government agencies. The keys can be used for court-approved wiretaps of encrypted communications.

In the letter to Cantwell, who is a leading Clipper opponent, Vice President Al Gore reaffirmed the use of Clipper for telephone communications but said it would not apply to computer transmissions.

Gore said the administration would continue to seek an approach that includes key/escrow but would consider software alternatives, which would be much less costly, and alternatives using nonclassified algorithms.

In response to concerns about possible government abuse of privacy rights, Gore said a new system "must permit the use of private-sector key/escrow agents." In addition, such a key/escrow encryption technique would be voluntary and exportable, he said.

Undermining Clipper

"This is significant," said Jerry Berman, executive director of the Electronic Frontier Foundation. "By committing themselves to another approach, they are undermining the market for Clipper."

"I don't see this [letter] as a major retreat," said Stephen T. Kent, chief scientist for security technology at Bolt Beranck and Newman, Inc. in Cambridge, Mass. "It could be that the administration is going to back off on pursuing the escrowed encryption standard in the computer domain, but we will have to wait and see."

Kent said he did not foresee the software industry rushing forward to develop a Clipper alternative. The "industry has not been aggressive about putting [encryption] in their products ... because the market doesn't demand it," he said.

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V.P. Information Systems
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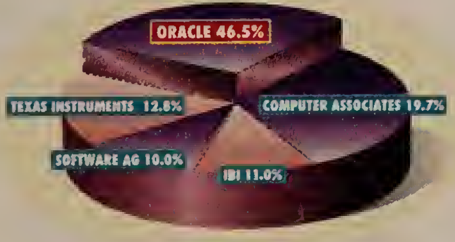

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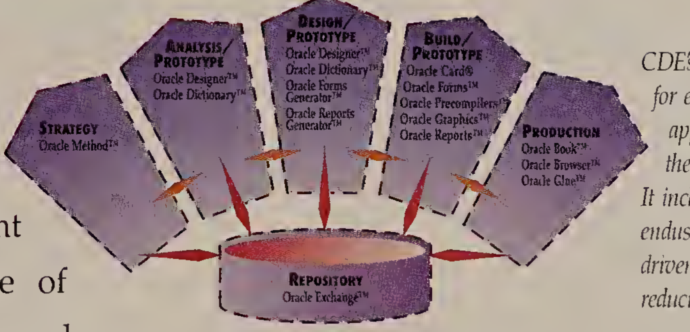
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Silicon marriage: HP/Intel venture

The prospect of meshing Hewlett-Packard's Precision Architecture-RISC and Intel's x86 on a future chip has been greeted with hoots of derision by competitors. One environment or the other will have to be generated through poky emulation, goes one gibe, and both may suffer.

"I don't know how you are going to merge them without blowing up your Intel performance as well as your PA-RISC performance," said Scott McNealy, CEO of Sun Microsystems, to attendees at SunWorld '94.

Neither Intel nor HP made it clear how they plan to effect such a union, although Intel's Senior Vice President Carl Everett all but ruled out emulation as an option in an interview with *Computerworld* on June 21. You start out emulating a different environment instruction by instruction, then you have to emulate the data types and data-handling characteristics "right down to the device drivers. The problem swells," he said.

Critics claim the HP/Intel venture won't happen any time soon — not before the end of the century. Everett disputes that charge. He makes it clear that some of the first features of a merged architecture will start appearing on Intel chips as early as the P7, the second generation follow-on to today's P5 Pentium chip (the P6 is due out in 1995). A fully merged architecture will appear sometime later.

The Meta View

The competition is making its gibes and jests at HP's and Intel's expense prematurely.

Charles Babcock

There remains, however, the question of how such a shotgun wedding can occur.

Michael Slater, editorial director of the "Microprocessor Report" in Sebastopol, Calif., notes that Intel and HP have said "nothing of substance yet" on how they plan to pull it off. Nevertheless, a dual-architecture chip is by no means an impossibility, he says.

Today's Pentium is a complex architecture with 3 million transistors on the chip. Sometime within the next decade, Intel will be cranking out chips with 10 million transistors, and on such chips it will be possible to etch three complete instruction sets, one for the x86, one for PA-RISC and a new one native to the architecture, Slater says. Such a chip will also contain 1M byte of memory.

While x86 and PA-RISC applications are likely to run at their top speeds on such a chip, its best performance will be reserved for those programs that run in its native-mode instruction set, Slater says. Eventually, Intel and HP customer bases will move — in a process that will take several years — to recompiled programs that run in native mode on the architecture, he predicts.

The instruction sets will have to remain distinct rather than be merged into a new superset because they do basic things differently. PA-RISC has an instruction to read the next operation from registers. x86 has an instruction to read it from memory. The future HP/Intel architecture is likely to include a temporary register, loaded from memory, where each next instruction would be retrieved, regardless of whether it was x86 or PA-RISC, he notes.

The nature of the operating environment needed by an application could trigger an on-chip switch that could select the right instruction set.

Any attempt to create such an environment is likely to set off a debate over whether HP/Intel was accomplishing what it said it would or merely resorting to on-chip emulation. It's possible that some of the new structures and internal translations of the architecture might be referred to as on-chip emulation. But if Intel and HP do not rely on an external software program, it will be hard to make the "it's only emulation" tag stick.

So I think the competition is making its gibes prematurely. The HP/Intel engineering team is a formidable one, and both companies remain world-class manufacturers. As circuits shrink and more elements are etched onto the chip, they are likely to find it within their grasp to unite heretofore disparate architectures.

Babcock is *Computerworld*'s technical editor. His MCI Mail address is 575-2737.

Mail armistice coming

Firms up efforts to ensure messaging products interoperate

By Lynda Radosevich

Bowing to user pressure, the major LAN messaging vendors appear to be making headway in stalled efforts to ensure that their products work well together.

A Lotus Development Corp. spokesman confirmed last week that Lotus and Microsoft Corp. are expected to reach an agreement on testing the interoperability of their prereleased messaging products. Specifically, that agreement will include Microsoft Exchange, Lotus Communications Server and a messaging integration switch from SoftSwitch, Inc., a company that Lotus plans to acquire, the spokesman said.

Also, Microsoft and Banyan Systems, Inc. agreed last week to a joint testing plan for prereleased messaging products to ensure interoperability. At the behest of corporate users, a WordPerfect Corp. official expressed interest in working out a similar arrangement.

Great importance

These steps are critical to users because of the increasingly complex multivendor messaging networks they manage. Without interoperability guarantees, users have no way of knowing, for instance, that vendor claims of "native X.400" support actually mean that the products work together. The technology enables interoperability but does not guarantee it.

Customer pressure will determine how well these products interoperate because "technology is not the issue here," said Don Price, a technologist at Texaco, Inc. in Tulsa, Okla.

The agreements are in response to miffed corporate customer demands that the vendors carry some of the burden for product interrelationships. At a meeting last week of the Network Application Consortium (NAC), which comprises Banyan's 30 largest corporate sites, users requested that the vendors work on verifiably interoperable directories, application programming interfaces and transports, according to David Whitten, a program director at Gartner Group, Inc. in Stamford, Conn.

"The need is to get a better understanding of what really works and doesn't beyond a vendor slide presentation showing support for native X.400," Whitten said. "For instance, what really happens when you call a Banyan StreetTalk directory from the Lotus Communications Server?"

The testing issue is coming to a head following sweeping consolidations in the messaging industry. The recent Lotus announcement to purchase SoftSwitch, for example, spurred disagreements over the terms of premerger interoperability testing plans between Microsoft and SoftSwitch [CW, July 18].

While the agreements are a good step, the bulk of the testing responsibility may still fall on users' shoulders. For instance, the NAC has agreed to come up with specific guidelines for their interoperability testing needs, and several volunteered their companies as test sites.

Texaco is one site already involved. The company is serving as a test bed for the interoperability of Microsoft's unreleased Exchange server and SoftSwitch's EMX integration switch, Price said. "I don't think any of this is going to be easy … but both sides are sensitive to my requirements that their products interoperate," he added.

Sun readies plan to market Unix servers as PC gateways

By Jean S. Bozman
MOUNTAIN VIEW, CALIF.

If you can't beat 'em, join 'em. That is the approach Sun Microsystems, Inc. is taking with a PC-friendly strategy to be unveiled later this year. Company executives said the strategy will include a series of network services positioning its Unix servers as PC gateways to the rest of the enterprise.

The move could be a strategic one for Sun, which has been losing ground in its battle to promote Unix desktops in place of PCs. The company is trying to boost profits by selling high-margin Unix servers to commercial accounts [CW, March 28]. Sun wants its servers to be considered vital links to Microsoft Corp.'s Windows PCs, Novell, Inc.'s NetWare LANs and corporate mainframes, analysts said.

To align its wares more closely with PCs, Sun is developing products based on the Novell IPX/SPX protocol stacks it licensed from Novell earlier this year [CW, March 21], according to Curt Wozniak, director of marketing at Sun Microsystems Computer Corp. Stopping short of announcing the products, Wozniak said the new software services for PCs would be delivered separately from the forthcoming Solaris 2.4 operating system that is due this summer.

New role

David Smith, an analyst at International Data Corp. in Framingham, Mass., said the IPX/SPX support is key to Sun's PC server effort. The Sun servers could take on the role of providing network services as well as access to remote data, TCP/IP networks and systems management services.

"Novell is still the server of choice for file and print services," Smith said. "I don't think anybody at Sun thinks they're going to take the file and print service away from Novell."

But a coexistence strategy — where NetWare sites want more advanced servers to access enterprise applications — could work for Sun. "I think it took a while for them to deal with the fact that they're not going to get the Unix on the desktop like they wanted," Smith said. But now "they see that the opportunities are as servers for the next two or three years."

Users reassured by NetWare 4.x fixes

By Suruchi Mohan

Novell, Inc.'s release of NetWare 4.02 leaves a lot to be desired, but it assures users that the company is serious about trying to deliver a stable product.

"NetWare 4.02 doesn't solve all the problems, but it shows Novell is learning and addressing planning problems [as well as] the fear of dealing with [NetWare 4.x]," said Jamie Lewis, president of The Burton Group in Salt Lake City.

"The announcement characterizes the next step in the maturation of the product," Lewis said. "There's a lot of resistance to using NetWare 4.x now; 4.02 is a solid step [forward]."

It is a positive announcement, according to Rod Franklin, west area director of advanced client services at systems integrator Entex Information Services in Irvine, Calif. "It brings together many random patches and fixes that have been applied to 4.0 and 4.01 and solves some of the issues in implementing a 4.0 network," he said.

Key features

NetWare 4.02: Shipping this month, it includes enhancements to NDS such as simple directory setup and installation, unlimited objects/containers and better server synchronization over wide-area links.

NetWare 4.1.: Expected by year's end, it will include NetSync, integration of Message Handling Service with NDS, a pruning and grafting utility, NDS support for the Macintosh and System Fault Tolerance III support.

"Most of the advantages of 4.02 are in the initial installation and directory advantages for the enterprise," said Steve Truesdell, information systems director at Granutech, Inc. in Largo, Fla. "Patches for 4.01 have been included in 4.02, which helps clean things up."

Administrators are sold

Others agree. This version offers simplified installation and setup of the directory, a major selling point for NetWare 4.x, Lewis said. Before, administrators had to plan the whole directory prior to setup. Now, they can install the directory and build it as they go along. However, it is still not easy to change objects in the directory, a limitation that Novell is expected to address when it announces 4.1 at the end of the year.

Version 4.02 also gives users the ability to print the directory tree in addition to viewing it, which is a great communication tool, said Arthur Heigl, director of administrative computing at Johns Hopkins University, who has been studying NetWare 4.x for a long time. "They are continuing to make utilities better and make overall adoption easier."

However, users said Novell did not think about NetWare 4.x as logically as it might have. "They thought of it as a new product instead of an upgrade, which needed migration," Heigl said. "They didn't provide migration tools, and there were problems with the tools they did bring out."

"My sense is that most people running 4.01 are running it in bindery emulation mode, which doesn't make a lot of sense to me," said Greg Scott, information services manager at the College of Business at Oregon State University in Corvallis. Novell needs to provide better integration of the bindery in the 3.x environment with NetWare Directory Services (NDS).

Theoretically, 4.1 will deal with these issues and others that users want. The version will provide better management tools, and the NetSync utility will let administrators manage the bindery from a NetWare 4.1 administration console.

Another issue is better tree management, which would make changing the shape of the tree and adding and deleting objects easier, according to Mike Bishop, senior project manager at U.S. BanCorp in Portland, Ore. Novell plans to address this with its directory pruning and grafting feature in NetWare 4.1.

Novell's NetWare makes network administrators' jobs easier. See page 108

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News Shorts

KnowledgeWare cuts work force again

KnowledgeWare, Inc. last week said it had cut 25% of its work force, eliminating 240 out of 947 positions due to poor financial performance in its fourth quarter ended June 30. The software development tools company, which last cut its staff a year ago, said 75% of the cuts will be made in domestic operations and the rest internationally. Restructuring charges will impact the company's first fiscal quarter next year, and final figures for KnowledgeWare's fiscal year 1994 will be available by mid-August.

IBM readies net management software

IBM is expected to roll out several network management tools tomorrow, including NetModeler, a network performance modeling tool for OS/2; NetView Distribution Manager for Novell, Inc.'s NetWare; a NetView Distribution Manager agent function for DOS; and a trouble-ticket product for NetView/6000. IBM is also slated to announce delivery of a previously announced product, NetView Access Services Version 2 Release 1 for MVS.

NASDAQ says the disk drive did it

The **NASDAQ** stock exchange, which delayed its opening by nearly three hours on July 15 due to computer problems [CW, July 18], last week attributed the glitch to a solid-state disk drive. Officials said an Amperif disk drive had failed during the early morning hours of July 15 as computers in NASDAQ's Trumbull, Conn., data center experienced problems with normal preopening market traffic. The exchange eventually opened at noon after tests confirmed the disk drive was operating sporadically and the storage device was removed.

Users say portability a priority

X/Open Co. last week released preliminary results of a worldwide user survey on open systems to be presented at its Xtra conference in Washington. More than 80% of the 889 users surveyed said having portable operating systems was a top priority. More than 70% plan to spend more on client/server applications, servers and networks in the next three years.

Apple reports upbeat quarter

Apple Computer, Inc. last week reported that revenue for the third quarter ended July 1 rose 15% over the same period a year ago, to $2.15 billion. The company also lowered the estimated costs of an ongoing restructuring program, adding $126.9 million to its earnings for the quarter, which totalled $138.1 million. In the same quarter a year ago, the company lost $188.3 million after a restructuring charge.

SHORT TAKES **Xyplex, Inc.** in Boxboro, Mass., said it won a $15 million pact to supply South African police with 3,000 of its Network 9000 intelligent hubs over the next two years.... **IBM** has split with **Phoenix Technologies, Inc.** on the distribution and development of IBM's SurePath Basic Input/Output System and compatibility tools.... James Schraith, most recently vice president of sales and marketing at **AST Research, Inc.**, has been appointed president and chief operating officer. He replaces Safi Qureshey, who will focus on expansion and forging new alliances.... **Alantec Corp.** in San Jose, Calif., last week unveiled the Powerhub 7000, its next-generation switching hub.... Attorneys for **Microsoft Corp.** and **Apple Computer** recently presented oral arguments in Apple's appeal of the ruling in its long-running look-and-feel suit against Microsoft's Windows.

Chicago ship to slip

Delivery may slide into next year

By Computerworld staff

Microsoft Corp. executives last week said antsy users should not look for Chicago, the next major update of desktop Windows, before Christmas.

"I think there is not a chance we will have the product to stores until January, even if [we] can get it to manufacturing in December," said Executive Vice President Steve Ballmer while speaking to a gathering of financial analysts at the company's Redmond, Wash., headquarters last week.

"Some time after [Daytona ships] — either late this year or early next — we'll bring out our high-volume version of Windows. This is the Chicago product," concurred Microsoft Chairman Bill Gates in a separate teleconference on the antitrust settlement last week.

Vice President Mike Maples also revealed plans to charge for a late summer beta test of Chicago.

In yet another briefing, this one on Chicago before an on-line Windows User Group Network audience on CompuServe that included consultants, developers and information systems managers, Microsoft outlined the following previously undescribed features slated for Chicago:

- **A documented Point-to-Point Protocol:** This should yield 32-bit communications drivers, which should greatly improve the access speed for users trying to get on networks.
- **Integrated file and desktop objects:** These let users delete files more efficiently.
- **Telephony Application Programming Interface:** This should provide enhanced fax support.
- **Support for the Motion Picture Experts Group standard:** It will better enable applications with full-motion video.
- **The 32-bit virtual file allocation tables:** They can be stored on floppies.

WinPad chip set may set back Microsoft

By Michael Fitzgerald

The makers of personal digital assistants (PDA) cannot even buy good news.

Microsoft Corp.'s At Work for Handhelds operating system, code-named WinPad, was supposed to rejuvenate the PDA market after Apple Computer, Inc.'s Newton debacle. But industry sources said the chip sets that were supposed to power WinPad systems may never reach the market in a PDA. If they do, boxes capable of running WinPad are unlikely to ship before the middle of next year — a full year after they were once expected to appear, the sources said.

The first WinPad boxes were supposed to run on an 80386 chip set called Polar, co-developed by Intel Corp. and VLSI Technology, Inc. Intel was to take the lead in developing an I486-class follow-on called Draco, with VLSI building the supporting chip set.

Polar and Draco are names of stars, but they might as well be the Shoemaker-Levy 9 comet, headed for the surface of Jupiter. Polar, which one source said had terrible performance, is a dead project, sources said, adding that Draco is in trouble but may not be dead just yet.

"Draco is flopping around on the beach right now, but it may get back in the water and start swimming again. The flies have Polar," said one official at a hardware maker with an announced WinPad project, who wished to remain anonymous.

An Intel spokeswoman said that work had been completed on the Polar chip set, but she would not comment on Draco. VLSI did not return phone calls.

A source near Intel suggested that later this year Polar would appear in pocket organizers, not in the handheld computer products that were expected.

Draco still has some potential for life because it is based on the 16-bit 486SXJ chip.

The delay, in fact, "could be the best thing to happen to this business," said Andrew M. Seybold, editor in chief of the "Outlook on Mobile Computing" newsletter in Brookdale, Calif. The lack of a communications infrastructure has hurt current offerings in the PDA market, and extra development time could fix that, he said.

Cost is another issue that could be mitigated during the delay. Cost was a factor in Compaq Computer Corp.'s decision to delay its WinPad box, the Mobile Companion. Sources expect 486 chips to be significantly less expensive by the middle of next year.

FCC to open PCS auction

By Michael Fitzgerald

The Federal Communications Commission will begin auctioning off the first Personal Communications Services (PCS) wireless networks today.

The auctions center on PCS licenses in the narrow-band (900-MHz) spectrum. These licenses will help set in place wireless networks that transmit small bursts of data good for paging; two-way paging; electronic mail; and acknowledgment paging, under which a person who sends a page receives a notice about whether it has been received.

Broadband PCS, which falls in the 1.8-GHz spectrum and is due to be auctioned off by year's end, is expected to be used for voice and large data file transmission.

"Narrow-band spectrum is where the hot action is going to be," predicted Timothy Schmidt, an analyst at Probe Research, Inc. in Orlando, Fla. Schmidt projected that two-way paging and acknowledgment paging in particular will be useful to businesses.

"Acknowledgment paging is very good to have ... because if your pager is off, you don't get my page and I don't know that," Schmidt said.

According to Schmidt, no U.S. networks currently do acknowledgment paging, although ARDIS offers it on its Canadian network.

Reason to be

Narrow-band networks, which will probably not be fully in place until late 1995 or early 1996, may be the enabler for personal digital assistants (PDA). PDAs have been billed as tools to communicate small amounts of information, but the only nationwide wireless networks for data today are ARDIS and RAM Mobile Data.

"Short messaging could give PDAs a reason to exist," said Iain Gillot, an analyst at Link Resources Corp. in Framingham, Mass.

As if to prove this point, Motorola, Inc. announced last week that it was delaying its Envoy PDA until the end of the year. Motorola said it needed to do more testing of the product, which was announced with much fanfare in March with a projected summer delivery.

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The Past, Present, and Future of Network Computing

Clustering lies at heart of Compaq/Oracle alliance

By Michael Fitzgerald
and Jaikumar Vijayan

Last week's agreement between Compaq Computer Corp. and Oracle Corp. is yet another piece in Compaq's strategy to make the PC play across the enterprise.

The long-expected deal [CW, May 10, 1993] establishes the Compaq Business Unit at Oracle in Belmont, Calif. It provides for joint development, testing, support and marketing of Oracle software on Compaq servers.

The unit's first goal is to put Oracle database software on Compaq's SmartStart CD, sources said. The SmartStart CD was designed to let users easily install and configure their systems for complex software.

The broader implications of the deal are databases that will run on clustered PC servers, sources said. Clustering lets users run a single application over multiple servers, which gives systems more channels through which to send data. Compaq plans to deliver new Proliant machines this fall that can be hooked up into a two-server "baby" cluster.

"Real clustering with dynamic load balancing and the like will not come until the latter part of '95," said Tom Kucharvy, president of Summit Strategies, a consultancy in Boston.

Compaq and Oracle officials declined to comment on Oracle, SmartStart or the issue of clustering.

User reaction was mixed.

One user at a large multinational pharmaceutical company, who asked not to be identified, said that clustering PC servers "could be a big advantage to us if it's really cheaper than RISC alternatives. The other thing is, if ... a server can be used either as a file server or clustered database server, that could give us some flexibility. You can't use an RS/6000 as a file server."

"Certainly it's a step in the right direction to where the industry is heading," said John Geyer, director of systems at the Financial Guaranty Insurance Co., a $1.5 billion company in New York. "On the other hand, it seems to me that Oracle and Compaq are in the same boat ... trying to seek out the right alliance that will give them enterprisewide clout."

Armed and ready

Compaq is expected to use its relationship with Oracle to help target the growing application server market. BIS Strategic Decisions projects that application servers will make up 14% of the 668,000 servers sold this year and 16% of the 865,000 servers sold next year.

Will they buy it?

But some users challenged whether companies will scale down their current minicomputer-based clusters to a PC server alternative.

Users who already run Oracle in clusters "aren't about to go to a smaller, unproven, PC-based replacement," said Michael Higgins, a database administrator at Byer California, a San Francisco-based clothing maker. Byer runs a three-node cluster of Sequent Computer Systems, Inc. machines for order-entry, inventory and other applications.

Analysts said, however, that Compaq's methodical approach to the enterprise will help it build credibility with information systems managers. The enterprisewide push has been part of Compaq's strategy for the past two years and will expand beyond Oracle to include other database partners.

"We will be a major enterprise provider, and if you combine the potential for clustering with internetworking, you have the ability to provide full networking solutions" in the enterprise, said one well-placed source at Compaq who asked not to be identified. Internetworking includes routers, hubs, remote access and network management, the Compaq source said.

Kim S. Nash contributed to this story.

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IBM moves System/36 operating system to AS/400

By Craig Stedman

In a concession to the remaining 150,000-plus System/36 holdouts who have not had new hardware since 1988, IBM confirmed last week that the System/36 operating system will be able to run on upcoming PowerPC-based AS/400 models.

As expected [CW, Feb. 7], PowerPC chips will actually appear first in a machine running the System/36 SSP operating system. The box, called the AS/400 Advanced System/36, is due out this fall, said Frank Soltis, senior engineer and architect at IBM's AS/400 division. That system will use a prototype PowerPC device that is too slow for the AS/400's more complex OS/400 software, he added.

More to follow

The SSP-only box is an interim step for IBM. It will be followed by support for running System/36 applications on the full line of PowerPC-based AS/400s, which IBM plans to introduce in mid-1995, Soltis said. Customers will be able to implement OS/400 or SSP, and the two operating systems could also be used simultaneously due to a redesign of the AS/400's interface code.

IBM has been trying to persuade System/36 users to make a complete migration to the AS/400, and there was considerable debate internally about the wisdom of putting SSP on the new hardware platform, Soltis acknowledged. "But now we're basically saying that if you don't want to move, don't move," he said.

Servers to go

IBM is developing a low-end server version of its AS/400 Portable system that could run networks of 10 to 12 PCs and cost less than $10,000. Frank Soltis, senior engineer for the AS/400, said the portable server should be ready to ship by the first quarter of next year, but marketing plans for the machine have not been finalized yet.

Stay where you are

That is music to the ears of Shannon Mueller, information systems manager at RFD Publications, Inc. in Wilsonville, Ore., and System/36 project manager for Common, the main user group for IBM midrange systems. Until now, System/36 shops were "left hanging" by IBM's unwillingness to bring SSP forward, she said.

But IBM finally realized after six years that a large pool of System/36 users are still not interested in changing to OS/400, Mueller added. "We want all the speed and power of the AS/400 [hardware], but we want it so that we don't have to get rid of everything we have."

Speed it up

The SSP-only system, due out this fall, will run up to four to five times faster than System/36 models. The performance gain will increase further when the full PowerPC-based AS/400 line becomes available next year, according to an IBM manager. Memory and storage capacities will also rise significantly. The AS/400 Division had planned to market the machine as a System/36, but IBM Chairman Louis V. Gerstner opted for an AS/400 name when he reviewed the plans a few weeks ago, IBM officials said.

Moving SSP applications to OS/400 "is not a simple migration" because of differences in database and code-generation technologies, Mueller said. In the last year, Common members drove the point home to IBM that System/36 customers could just as easily switch to rival hardware platforms, she said.

Estimates on the remaining number of System/36 machines range from 150,000 to 200,000 worldwide, down from a peak of about 350,000. David Andrews, managing partner at D. H. Andrews Group, Inc., a consultancy in Cheshire, Conn., predicted that more than half of the remaining machines could be switched to AS/400 hardware in the next few years.

Put to the test

Carson Soule, president of Computer Applications Specialists, Inc., a software vendor and AS/400 reseller in Beltsville, Md., said the SSP plan might also benefit AS/400 users. It would provide an early testing ground for the multiple operating system personalities that the AS/400 is scheduled to get in 1996 via IBM's Workplace microkernel technology.

"Even if [SSP] isn't a personality that you really care about, it injects a dose of reality into all of that," Soule said. "For now, you sort of have to question whether [multiple personalities] will work in the real world."

Digital fills in blanks on organizational redesign

By Mary Brandel

In a pair of announcements last week, Digital Equipment Corp. laid out more details of what it called the "total redesign of our business" and announced the sale of a portion of its storage unit to Quantum Corp.

Yet to come is a true sense of "the new Digital," as promised by Chief Executive Officer Robert Palmer in May, analysts said.

"Ninety-five percent [of what they've said] has been on the organization, and 5% has been stuff that you can occasionally glean about the strategy," said Richard Buchanan, an analyst at Forrester Research, Inc. in Cambridge, Mass.

At the heart

The company said the transition to the new design will be completed by Jan. 1, 1995. So far, it is clear that the core of Digital's businesses is the Computer Systems Division. This includes PCs, systems, related software and a direct sales force that will concentrate only on the Top 1,000 accounts, not the 8,000 that Digital previously supported directly. Enrico Pesatori is acting general manager of the division.

The direct sales force will also provide "a level of systems integration," Pesatori said. Analysts said — and Pesatori implied — that partnerships with systems integrators are a likely source of that expertise. Digital is [illegible]king to sell its professional services unit, an[illegible]

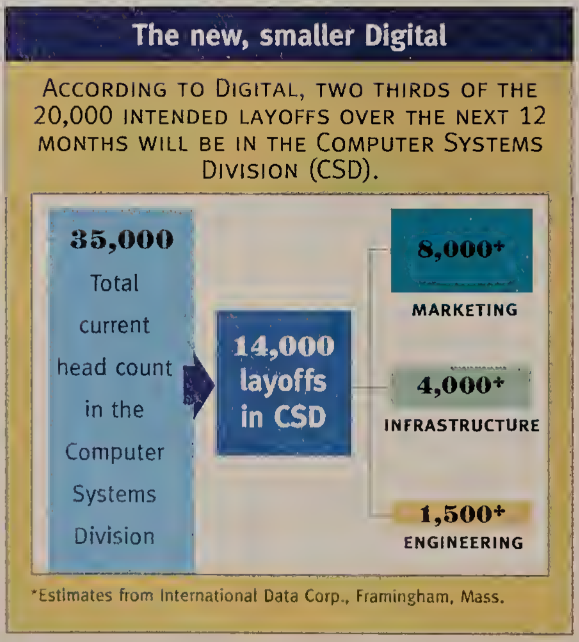
The remainder of the systems business unit will "have no other charter in life," Pesatori said, but to design, build and price products to be sold through indirect sales.

Analysts said Digital has removed some major barriers to selling indirectly. However, Peter Raulerson, president of Paratechnology in Bellevue, Wash., said "It'll take six months before customers and the channel members believe" Digital is serious. "It will be 18 months from there before revenue really comes in this way."

Despite the fact that the Computer Systems Division is the most strategic at Digital, two thirds of the announced 20,000 layoffs will take place here (see chart).

The new, smaller Digital

ACCORDING TO DIGITAL, TWO THIRDS OF THE 20,000 INTENDED LAYOFFS OVER THE NEXT 12 MONTHS WILL BE IN THE COMPUTER SYSTEMS DIVISION (CSD).



*Estimates from International Data Corp., Framingham, Mass.

Further, the division will concentrate on high-volume market opportunities, not niche markets. "We won't apply engineering where there's no chance of winning," Pesatori said.

Complete turnaround

Analysts said this is a big change for Digital. "They're switching [their orientation] from building the biggest, best and fastest to customer-driven, volume-oriented products," said Chris Christiansen, an analyst at International Data Corp. in Framingham, Mass.

Another tactic for Digital is to seriously consider getting out of businesses that do not represent its core strengths. Pesatori declined to name specific businesses. However, he did emphasize the importance of Intel Corp. and Alpha platforms as well as its current three operating systems strategy. The company will not abandon networking, he said.

One big problem, some analysts said, is that they still have no sense of how Digital intends to increase revenue.

But Pesatori said the answer was quite simple: "The systems division, excluding PCs, is highly unprofitable today," he said. "Our goal is to turn the business around to profitability by the end of the year."

What's the deal?

Digital's sale of its disk and tape operations to Quantum changes the company in one major way: It no longer manufactures soup-to-nuts systems.

The company downplayed the importance of storage to a systems vendor. "It's an artifact of history [that comes] from the days when everyone had proprietary systems," said Charles Christ, who is credited with bringing the storage unit to success and will head up the new Components Division.

Analysts said users will see no ill effects because as part of the deal, Quantum will provide a "substantial percentage" of Digital's storage needs, meaning Digital will effectively continue to use the technology once it is sold.

In other terms of the deal, which is expected to close Oct. 1, Quantum will pay Digital $400 million and will absorb all 5,000 of the temporary and full-time workers.

The price was seen as somewhat high for the $750 million business. But Quantum is expected to benefit particularly from the acquisition of Digital's progress in the head technology known as magnetoresistive, or MR, which substantially increases disk aerial density. —*Mary Brandel*

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Decree

CONTINUED FROM PAGE 1

president and chief executive officer at Inference Corp. in El Segundo, Calif. The Justice Department "attacked the most solid complaints that were easily understandable, but they got out from underneath all the meaty issues which have to do with the fundamental influence Microsoft has in the marketplace."

Despite government claims that the settlement will create more competition, the bottom line will be little effect on most users' purchasing or technology plans.

The impact on users "is blowing in the wind right now," said Shannon Mueller, information systems manager at RFD Publications, Inc. in Wilsonville, Ore. "Until the dust settles, no one is going to know for sure whether they'll benefit."

Change is in the air

For example, under the settlement made public last week, Microsoft dropped its controversial "per-processor" licensing and terminated "minimum commitments" in OEM contracts for its mainstream operating systems products.

For Doug Michels, executive vice president and chief technical officer at The Santa Cruz Operation, the decision means, "The OEM can say, 'I'm going to put Unix on this machine, and I don't have to pay for DOS.' The market is more open and more competitive now."

But other observers doubted the settlement will spur users to adopt non-Microsoft systems for their desktop computers.

My clients "are concerned about moving to Chicago, so they'd really panic if you moved them onto OS/2," Cornfield said.

Ed McCracken, *CEO of Silicon Graphics, Inc., said the settlement "... shows that Microsoft can compete with anybody, including the Justice Department."*

No takers

Interviews with PC hardware vendors last week indicated few are likely to switch to a competing system any time soon.

"Customers have already voted with their dollars in a very strong way for DOS and Windows. I don't see that changing," said Howard Elias, a vice president at AST Research, Inc.

However, some users of competing operating systems are miffed over the deal and feel cut out by the settlement because the Justice Department did not take more stringent action against Microsoft to ensure the survival of the systems to which they have committed.

"Justice could have found multiple smoking guns if they'd continued" investigating, fumed one OS/2 user at a large Midwestern firm. The user had submitted to the Justice Department what he considered proof of "user harm" from Microsoft's alleged monopolistic behavior. That harm included independent software vendors terminating work on OS/2 versions of applications that users had come to depend on, according to the user who asked not to be identified.

On the developer side, many high-profile industry executives declined to comment, instead ducking behind polite statements. A spokesman for one developer explained that many disappointed vendors believe that criticizing either Microsoft or the Justice Department at this point is a "lose-lose" situation.

Key developers, including IBM and Novell, Inc., one of the investigation's most ardent supporters, mostly lined up with Justice's assertion that the settlement is a win for the industry.

"It is much better that we get some definitive relief at this point in three or four major issues rather than remain in the black hole of litigation for the next three to five years, and no one has any certainty as to how to conduct themselves," said David Bradford, senior vice president and general counsel at Novell. "This at least gives us very clear direction" as to what Microsoft can and cannot do, he said.

IBM officials were also optimistic. "IBM knows what it is like to conduct business under a consent decree, but now we get to take off the gloves and take some aggressive actions," said Lee Reiswig, president of IBM's Personal Software Products group.

Conversely, Sun Microsystems, Inc.'s general counsel Michael Morris said the settlement addressed Microsoft practices that needed to be addressed, but which are not the source of their current dominance of the industry. "Only if Microsoft is required to publish the system calls in a timely and even-handed fashion can [the industry] free [itself] from one technical source."

Additional *Computerworld* staffers contributed research and reporting to these reports.

A step-by-step look at the Microsoft case

By Mitch Betts

WASHINGTON

Microsoft Corp. has now joined IBM and AT&T Corp. in the distinction of having been officially declared a monopolist by the U.S. government. The following is an explanation of the charges and the proposed settlement:

Q: What did the government do?

A: The U.S. Department of Justice's Antitrust Division filed two documents at the U.S. District Court in Washington. One was a civil complaint with the antitrust charges against Microsoft. The other was a proposed settlement.

Q: What were the charges?

A: The Justice Department identified the following three Microsoft practices that denied competitors a fair chance to get their operating systems loaded onto PCs for sale:

- Per-processor contracts with PC makers that forced them to pay royalties for MS-DOS and Windows on every processor they shipped, even if the machine did not ship with that software. This forced PC makers selling non-Microsoft operating systems to pay two royalties — one to Microsoft and one to its competition — potentially making a rival system more expensive.
- Unreasonably long contracts with PC makers — typically three to five years — that included minimum commitments that effectively excluded rival operating systems from the market.
- Overly restrictive nondisclosure agreements to prevent third parties that test beta products such as Chicago from working on rival system software.

In essence, the Justice Department alleged that Microsoft has used these unfair practices to maintain a monopoly power in the operating systems market since at least the mid-1980s, with market share consistently in excess of 70%.

Q: Were consumers harmed?

A: The government said users may have paid higher prices for PCs with non-Microsoft operating systems because of the per-processor contracts. It also claimed that Microsoft's practices generally discouraged the development of competing operating systems (and related applications).

Q: What are the remedies?

A: The proposed settlement prohibits Microsoft from using per-processor licenses and minimum purchase terms. Licenses are limited to one or two years.

Nondisclosure agreements are limited to one year and may not prevent programmers from working on rival operating systems as long as Microsoft's proprietary information is not disclosed.

Furthermore, Microsoft cannot require PC makers to purchase another Microsoft product as a condition for licensing a Microsoft operating system.

The settlement will last for six and a half years after it is signed by the presiding judge. Microsoft agreed to abide by the settlement terms immediately.

Q: What Microsoft products are covered by the settlement?

A: MS-DOS 6.22, Microsoft's Windows 3.11, Windows for Workgroups 3.11 and all predecessors and successors of those products, including the forthcoming Windows 4.0, code-named Chicago.

The settlement does not apply to Windows NT Workstation or Windows NT Advanced Server.

Door opened to more suits

By Computerworld Staff

Despite the recent settlement, Microsoft may not be off the hook yet. Users, developers and OEMs who believe they have been harmed are not precluded from suing Microsoft for damages, said Robert E. Litan, deputy assistant attorney general, who was involved in negotiating the settlement.

That may not be very likely, however, since most people who would even discuss such an action declined to speak on the record.

"Microsoft is your bread and butter here. What are you going to do, screw your future?" asked an official at a leading hardware maker.

David Wu, an analyst at S. G. Warburg and Co., a brokerage in New York, agreed. "If you want to get out of business, that's one way of doing it."

However, David Bradford, senior vice president and general counsel at Novell, Inc., said "the fact that the consent decree gives no specific relief on that does not bar third-party companies from seeking private relief from Microsoft through a private antitrust lawsuit." Nor does the settlement bar the Department of Justice from taking another look at Microsoft in the future, he added.

Suit unlikely

Bob Holmes, a technical consultant at Southern California Gas Co. in Los Angeles, is not optimistic that an effective class-action suit can be mustered by large information systems organizations.

However, Holmes, as a spokesman for the roughly 1,000-member OS/2 user group called the International Phoenix Alliance, said the group is petitioning Assistant Attorney General Anne K. Bingaman to relieve IBM of some of the constraints of the consent decree it signed in 1969.

The group's three founders believe that IBM is still handicapped by not being able to bundle software and hardware with the same flexibility as its competitors. Also, IBM still can not preannounce or pretest unreleased products the way some claim Microsoft has.

Gates

CONTINUED FROM PAGE 1

attest to the question of whether their allegations had any truth or basis.

Q: How will this settlement impact computer users/buyers?

Gates: I can't foresee any immediate impact on buyers. If you pick up a catalog from a computer manufacturer today, you can look in there and see many different operating systems such as OS/2 and many forms of Unix available to those buyers. So whatever a buyer wants on their systems, they've had an opportunity to get for a number of years. So that status quo will be maintained.

Q: What do you think the impact of this will be on other players?

Neukom: We don't think [our licensing agreements] have had any significant effect on the popularity of our products. And the competition will continue to be what it has always been, which is: Who is it that is creating good technology and bringing it to OEMs and, through them, to consumers on competitive prices.

Q: Should there be a Chinese Wall between your operating and applications divisions?

Gates: We do not restrict the flow of information between our systems division and our applications division. That is, if our applications division has an idea for improving our systems software, we encourage them to tell the systems division about that. We have never said that we are creating some type of wall. And we endeavor to get information out to other people so they can do work.

Q: Are OS/2 and Workplace software a threat?

Gates: OS/2 is a competitor of ours, but the key things that affect that competition are not affected by the form of our license agreement but rather by end-user demand, which is where we see ourselves growing stronger. My forecast is that sales of OS/2 will decline.

Q: What does it mean to be monitored by the Department of Justice for the next six and a half years?

Neukom: The department has certain rights to gather information from us, to interview people who are involved in the implementation of the consent decree here. I don't foresee any way in which that monitoring should become a significant distraction or problem.

Bingaman

CONTINUED FROM PAGE 1

years. We were within hours of suing them before they capitulated. If this [settlement] was such a "nothing," why did they fight it?

Look at the settlement and the relief we got. They can compete now on price and quality. That's it. No more unfair competition. It's now a level playing field.

The press is buying Microsoft's line and quoting Wall Street analysts angling for Microsoft's business. These are totally biased sources who are toadying for bucks from Microsoft.

Q: Why doesn't the settlement address Microsoft's control over the application programming interfaces for its operating systems?

A: We never raised it because in our best judgment, [attacking that issue was not legally supportable]. We did not bargain away anything.

Q: Why is Chicago covered but not Windows NT?

A: Because Microsoft does not have monopoly power in Windows NT right now, while Chicago is a follow-on to Windows and DOS, where they do have market power to impose restrictive contract terms.

Q: Were you eager to avoid a costly trial?

A: We would have been very happy to sue them. We got 100% of what we would have gotten at the end of a trial and appeal — and we got it yesterday instead of three years from now after trial and appeal.

Q: Will you continue to monitor Microsoft and possibly reopen the case?

A: We'll be watching Microsoft's volume-discounting practices with extreme care and interest. We will monitor any other complaints that the industry has. We have a number of lawyers who are now expert in the industry, and we're open for business. For example, we looked into those [restrictive nondisclosure] complaints, and we have now barred that avenue from Microsoft.

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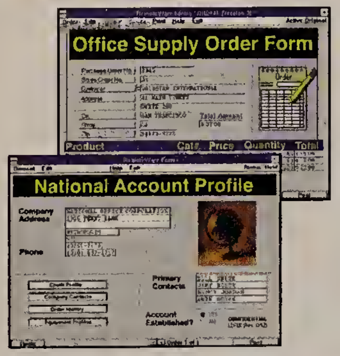

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1994 second-quarter earnings

Company	Revenue April through June	Percent change from 1993	Profit April through June	Percent change from 1993
AT&T Corp.	$17.7B	9%	$1.1B	12%
Boole & Babbage, Inc.	$33M	14%	$.228M	-87%
Comdisco, Inc.	$514M	.2%	$22M	4.8%
Compaq Computer Corp.	$2.5B	53%	$210M	105%
Computer Associates International, Inc.	$477M	13%	$69M	124%
Control Data Systems, Inc.	$131M	14%	$.683M	-84%
Hogan Systems, Inc.	$19.8M	27%	$.08M	-96%
IBM	$15.4B	3%	$668M	NM
Storage Technology Corp.	$361M	.67%	$14.4M	NM
Sun Microsystems, Inc.	$1.4B	11%	$78M	2.3%
Tandem Computers, Inc.	$544M	14%	$49M	NM

NM = Not meaningful

Mixed bag for high-end vendors

By Thomas Hoffman

When it comes to big vendors making a transition from the old to the emerging world, at least one is succeeding, one is faltering and one is failing.

Brushing aside leveled-off mainframe software sales, Computer Associates International, Inc. posted strong quarterly results from sales of midrange and client/server products. Meanwhile, Unisys Corp.'s recovery shifted to a lower gear as sales of its client/server offerings sputtered. And Digital Equipment Corp. this week is expected to show an operating loss in addition to taking a huge write-off to fund layoffs.

While CA's mainframe revenue grew a mere 4% last quarter, the company's midrange product sales more than doubled, fueled by sales of CA's Unicenter distributed systems management package.

"There's an opportunity in the marketplace for someone to dominate systems management at the server level, and everyone else besides CA is selling vaporware right now," said Charles I. Frumberg, a financial analyst at UBS Securities in New York.

Although the $2.1 billion software giant is expected to achieve single-digit mainframe revenue growth for the next several quarters — compared with its typical 15% high-end growth — analysts remain bullish about CA's future revenue and earnings potential. Revenue and earnings from its acquisition of The ASK Group, Inc. (completed June 22) and a 12-year enterprise licensing pact with Electronic Data Systems Corp. are expected to positively impact the bottom line in the September quarter, analysts said.

The outlook is considerably less rosy for Digital and somewhat uncertain for Unisys. Digital, which posts its year-end results tomorrow, is expected to show an operating loss of about $500 million, not including an expected $1.2 billion charge to cover further restructuring and staff reductions.

"Now that [Digital has] a restructuring plan out on the table, we have to ... see how it plays out," said William J. Milton Jr., an analyst at Brown Brothers Harriman in New York. "The September quarter will be much more critical," Milton added. Digital Chief Executive Officer Robert Palmer has promised a return to profitability for the company by the second quarter, which ends Dec. 31.

European troubles

For Unisys, the results were mixed. Although services at the $7.74 billion company grew a solid 31% to $486 million last quarter, sluggish equipment sales in Europe shattered profits. These nosedived to $50 million from $103 million the same period a year ago.

Perhaps the greatest concern for Unisys is the state of its moribund client/server business. The unit, which provides Unisys with less than 10% of its total revenue, has experienced single-digit revenue declines in each of the past five years in a market that is witnessing double-digit growth, according to Dewaine L. Osman, Unisys' vice president of corporate planning and business development. For example, Unisys' $750 million in workstation and server sales last year is expected to slip to $633 million for 1994, according to Curt Rohrman, an analyst at CS First Boston Corp. in New York.

Last month, the company hired Alan Lutz, a former Northern Telecom, Inc. executive, to head up its client/server efforts as president of Unisys' Computer Systems Group. "I'm not satisfied with where our client/server business should be," Osman said.

Senior writer Mary Brandel contributed to this story.

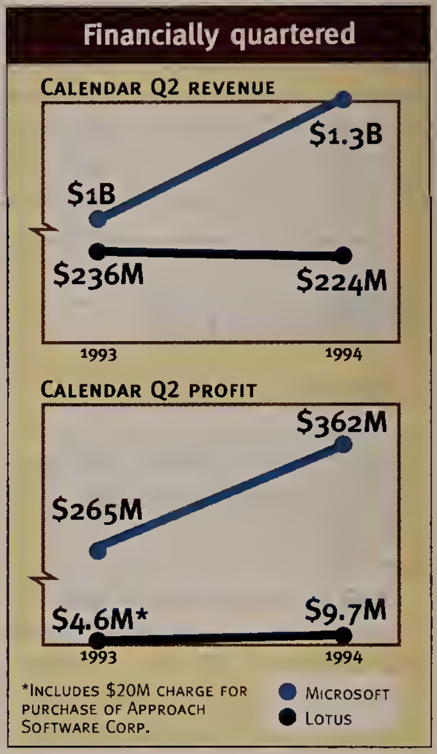
Microsoft soars, Lotus falls short

By William Brandel

Providing further evidence of its dominance of PC software applications, Microsoft Corp. posted a huge boost in sales and profits for its fourth quarter and fiscal year — much of it at the expense of bitter rival Lotus Development Corp.

Microsoft posted a $1.15 billion profit on $4.65 billion in revenue for its 1994 fiscal year, more than a 20% increase over last year's numbers. Moreover, Microsoft racked up $1.29 billion in sales in its fourth quarter ended June 30, representing almost 28% of its revenue for the year.

Analysts said Microsoft turned in a strong performance for the quarter and hit its estimated earnings projections.



*Includes $20M charge for purchase of Approach Software Corp.

Microsoft's dominance of the PC applications market continues to strengthen, particularly in the area of software suites. The company raked in 65% of total revenue in the quarter, or $840 million, from applications alone.

Revenue drop

In sharp contrast, Lotus pulled in $224 million in total revenue during the same three-month period, falling short of the low end of its own earnings projection — $230 million. Lotus officials acknowledged they lost a few percentage points in the suites and applications market to Microsoft during the quarter. Most projections give Microsoft a commanding 80% of the suites market, with Lotus taking a large chunk of the remainder of the market.

Lotus officials said the firm was hurt by not shipping SmartSuite 3.0 or Version 5.0 of 1-2-3 for Windows during the quarter. At the same time, Lotus' sales of DOS products were down 40% from last year.

While Lotus theoretically should be able to recoup its missed sales opportunities when it ships its products in coming months, analysts are still lowering their earnings forecasts for Lotus for the remainder of the year. Novell, Inc.'s WordPerfect group will ship an application suite of its own, further pressuring Lotus' desktop sales.

"I do not have much confidence for their second half," said Michael Wallace, an analyst at UBS Securities, a Wall Street brokerage firm. "They are slipping closer to when [Microsoft's] Chicago is expected to ship, which gives them a smaller window of opportunity to sell these products."

Mainframe sales save IBM

By Craig Stedman

What new IBM? With its PC business in turmoil, mainframes saved IBM's bacon in the second quarter and in fact played a leading role in enabling the computer giant to again exceed Wall Street's profit projections. But some analysts questioned whether mainframe dependence is good for IBM's long-term health.

In a repeat of its first-quarter earnings surprise, IBM comfortably outpaced estimates that net income would be about $400 million. While revenue of $15.3 billion was estimated, strong profit margins drove income up to $689 million.

A 14% cut in spending contributed, but analysts gave much of the credit to a revived mainframe business. Increased demand, coupled with supply constraints, have allowed IBM to reduce ES/9000 prices by less than it planned, helping both its top and bottom lines.

Excluding storage, which continues to see sharp price cuts, mainframe revenue was down less than 10%, said Michael Geran, an analyst at Pershing & Co. in Jersey City, N.J. "There's been a Lazarus-like recovery in the systems business," he said. "It's ironic."

"What drove this last quarter is the old IBM with a little bit of an expense-reduction twist," said Curt Rohrman, an analyst at CS First Boston Corp. in New York. "It's the proprietary stuff that's holding them up." Rohrman increased his 1994 profit projection for IBM but said he remains bearish for the long term because of IBM's reliance on mainframes.

By contrast, IBM's PC business is a trouble spot. Jerome York, IBM's chief financial officer, said PC revenue declined in the U.S. during the second quarter due to price reductions that were made to work off $600 million in excess inventory.

Worldwide PC growth was limited to single digits, York said.

Promised changes, including a streamlining of IBM's PC product offerings, are scheduled to be officially announced in the next couple of weeks, and PC margins should improve in the second half as the inventory crunch eases, York said.

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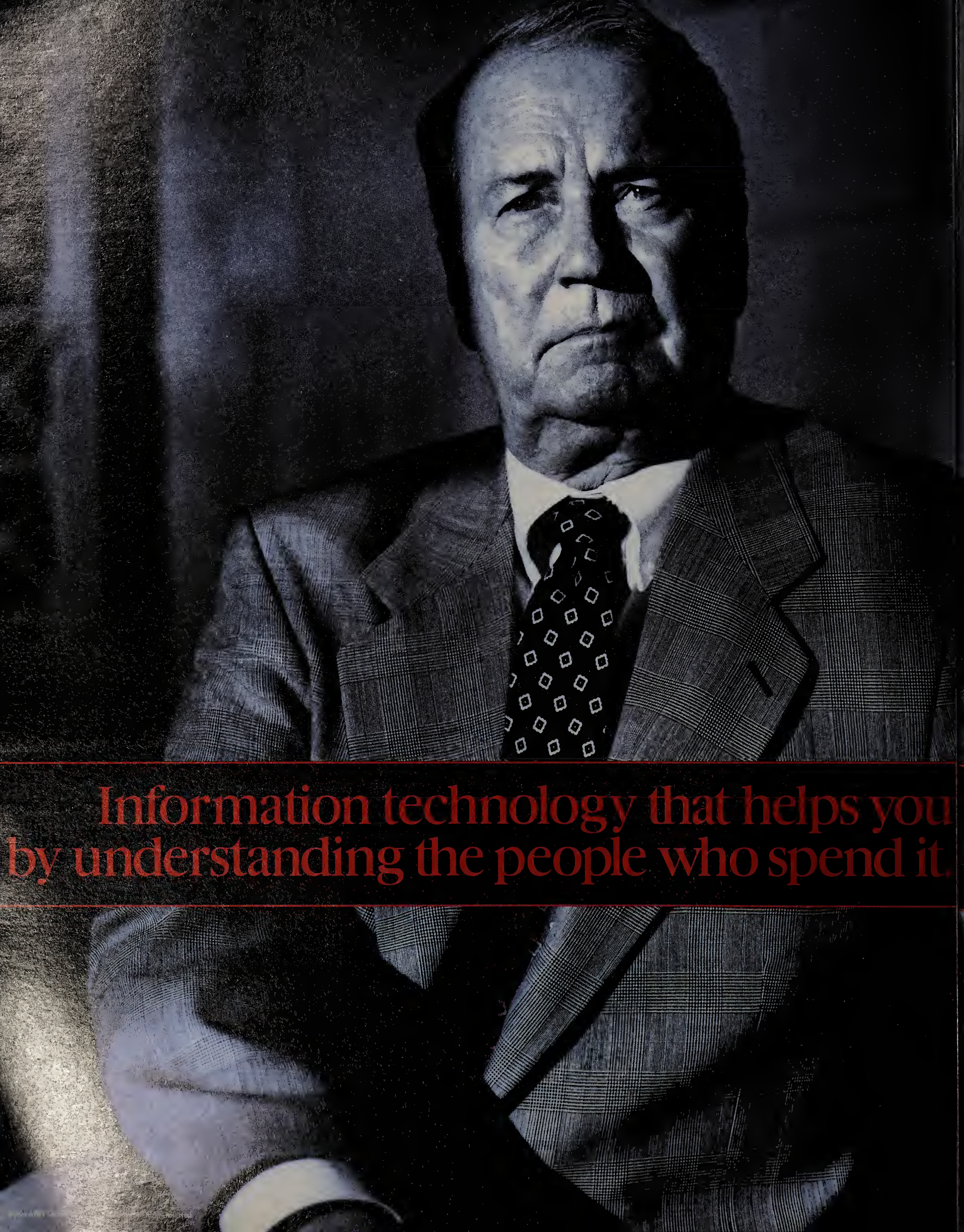
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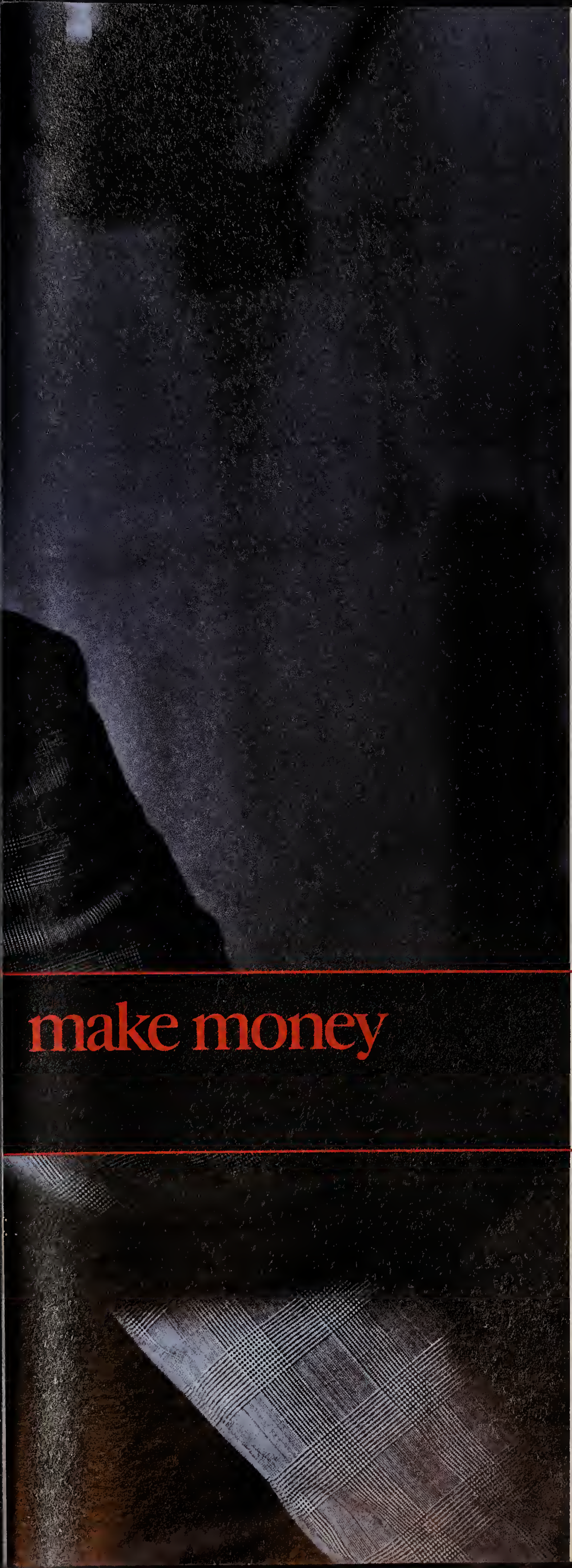

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JC Penney to outfit stores with client/server networks

By Ellis Booker

In its largest infrastructural upgrade in years, JC Penney Co. two weeks ago disclosed plans to spend $12 million to upgrade its nationwide store network, in part by migrating from an IBM SNA architecture to a peer-to-peer network using TCP/IP.

The contract with AT&T Global Information Solutions (GIS) will enable JC Penney to develop a client/server-based network for its 1,242 stores. The mammoth retailer will spend even more money upgrading its in-store computers, servers and back-office applications.

The new network, designed jointly by JC Penney and AT&T GIS, is actually "just the tip of the iceberg," according to David Evans, vice president and director of information systems at the Dallas-based chain.

JC Penney will spend even more to upgrade the processors in the stores from IBM Series/1s to Unix servers and client PCs, Evans said. The stores will be outfitted with AT&T GIS' 3416 servers and 3232 desktop PCs.

The upgrade project, which began quietly last September, will give JC Penney an 18% increase in network throughput. The retailer will replace multidrop 9.6K bit/sec. dedicated lines with 56K bit/sec. lines. According to Evans, service fees for the faster network will cost no more than fees for the old one.

The 56K bit/sec. and T1 dedicated lines will terminate in AT&T GIS' StarWAN 7000 routers at the JC Penney Data Center.

"What this does is establish a key link in the platform, linking the stores together more tightly," said Robert Salerno, a partner at Coopers & Lybrand in New York.

New accessories

By Oct. 15, JC Penney will have deployed AT&T GIS' StarWAN 4000 routers in about 700 of its stores. The new client/server applications will give stores access to far more sophisticated applications, including a decision-support module and a distributed nationwide gift registry, through the retailer's huge DB2 databases.

Salerno said he was not aware of other national department chains that have moved to such a wide-area TCP/IP network infrastructure. "This puts them ahead technology-wise," he said.

One of the most visible applications enabled by the architecture will be JC Penney's gift registry, an interactive kiosk to be developed in the next two years.

Evans said the registry will let shoppers select gifts for registered customers at any of its stores nationwide.

Other applications in various stages of testing include an in-store decision-support management system called InfoVision and new inventory and point-of-sale systems.

One of the crowd

According to Thomas H. Friedman, editor of "Retail Systems Alert," a newsletter in Newton, Mass., all retailers are moving decision-support and inventory-replenishment systems out to the field, where the consumers' "pull" drives a store's activity rather than the "push" from planners at headquarters.

Friedman said JC Penney competitors such as Wal-Mart Stores, Inc. and Kmart Corp. put client/server computing into their stores years ago. JC Penney's lateness, he explained, is because the company "is a very methodical organization and a wise user of traditional computing technology."

Indeed, JC Penney will continue to use its mainframe-based DB2 databases — which hold more than 1 billion rows of information for some inventory applications — to drive many of the new applications. "We've found DB2 to be cost-effective," said Evans, who nevertheless is considering putting specialized database query servers in front of these mainframe hosts.

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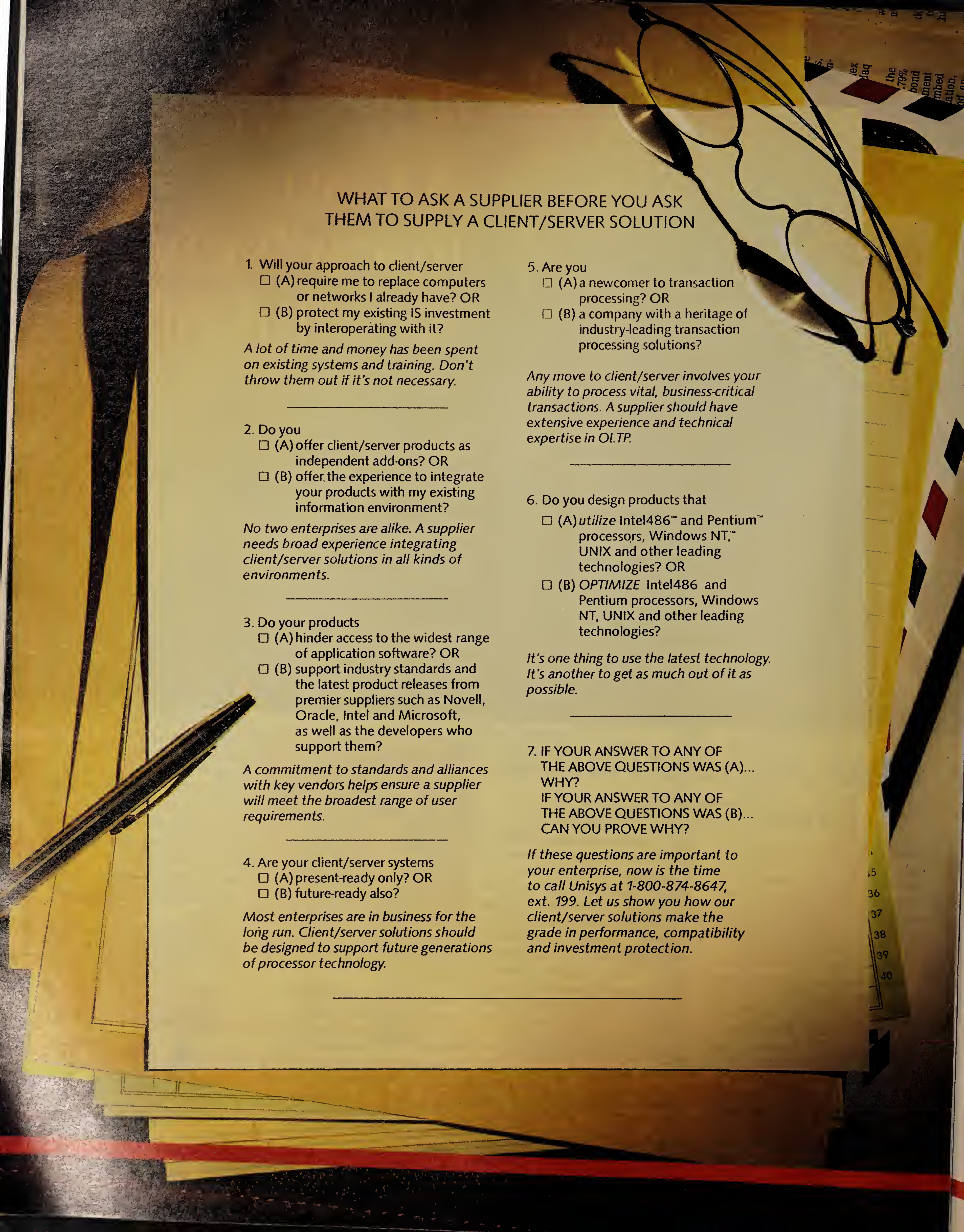

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   - ☐ (B) future-ready also?

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   - ☐ (B) a company with a heritage of industry-leading transaction processing solutions?

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Plan for fail-safe railroads now on track

By Mitch Betts
WASHINGTON

Safety experts say the railroad industry's 10-year effort to create a fail-safe computer system for preventing train crashes has chugged along too slowly. Since 1988, there have been 116 train accidents, including 30 fatalities that could have been avoided with such a system.

But now there are signs the potentially expensive and complex automation project is picking up speed.

Earlier this month, the Federal Railroad Administration (FRA) said it will require the industry to use a so-called "positive train control" system on selected high-risk rail lines by the year 2000.

In essence, the technology involves linking wireless data communications from each railroad's control center to computers in the locomotives. The system would monitor nearby traffic and work crews and, if necessary, apply the brakes to slow down or stop a train.

Meanwhile, the Association of American Railroads is drafting technical specifications for the system and, most important, Union Pacific Railroad Co. and Burlington Northern Railroad Co. are jointly preparing a 600-mile field test of the technology in the Pacific Northwest. In the latter case, the safety system will be developed by the railroad's operations unit, not by the information systems department, said a spokesman for Union Pacific in Omaha.

Several of the large railroads already have computer-aided dispatching systems and business-oriented systems that track freight cars. However, they do not include collision-avoidance features.

A big issue for the railroads is cost. Start-up costs for the safety system are estimated at $843 million to $1.1 billion nationwide, a price tag that led the federal government to conclude that the requirement should be limited to high-risk lines.

Clear channel

Train crews now get their instructions over voice radio links. But the FRA recommended that railroads replace those systems with wireless data links to an onboard computer. That way, train crews will no longer need to decipher crackling radio traffic and write down their instructions, which can lead to errors and safety problems.

Charles E. Dettmann, a vice president of the railroad association, said system costs are 15 times greater than the benefits, but the industry will move forward with the research. The technology "is important and has potential, but it has not been proven," Dettmann testified at a congressional hearing earlier this month.

Crossing borders

A key technical challenge is to ensure that the onboard computers can respond to commands from any control center, since trains often travel in another railroad's territory.

In the field test, for example, Burlington Northern plans to use Rockwell, Inc.'s VHF data radio network, while Union Pacific will use a UHF network. The onboard computers, therefore, will have to be equipped with dual-band receivers that can receive both signals.

Since 1973, the National Transportation Safety Board has repeatedly called for a fail-safe system that would override the engineer's controls if the train is going too fast or if the engineer is incapacitated or asleep.

The safety board was unhappy with the slow pace of development, but it is now "very encouraged with these developments and is anxious to see the actual system in operation," said James E. Hall, acting director of the safety board.

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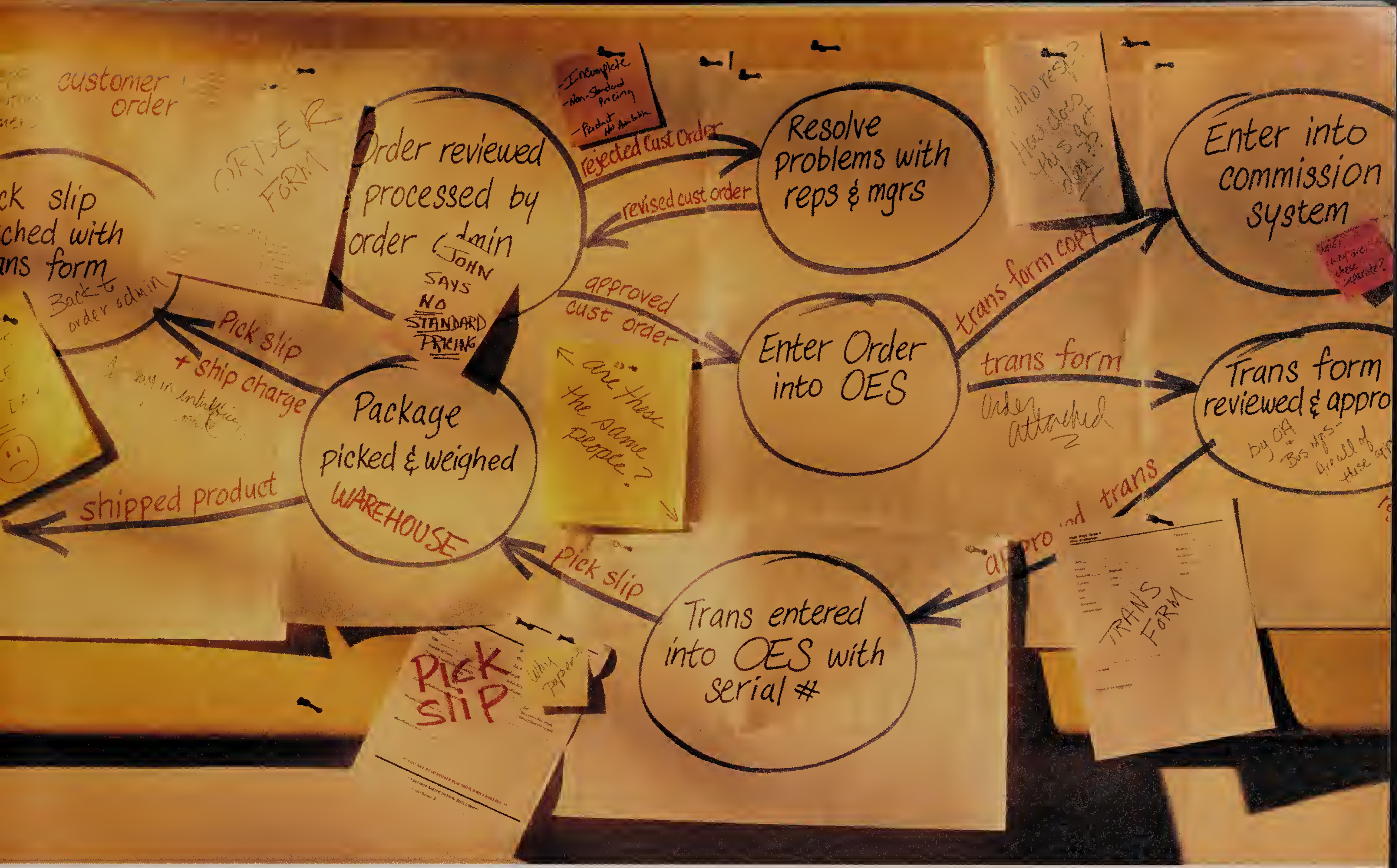
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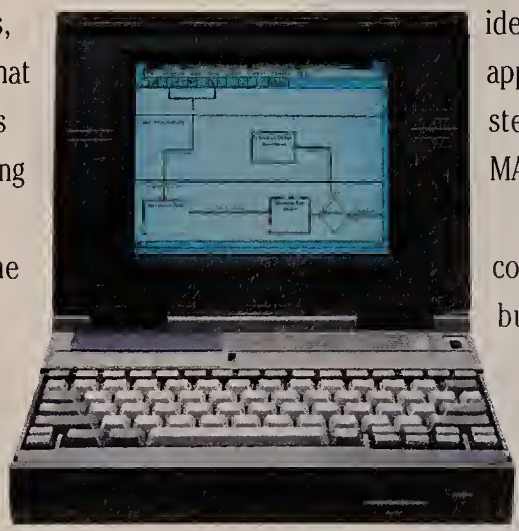

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Security holes found in Unix sendmail

By Gary H. Anthes

The Computer Emergency Response Team (CERT) at Carnegie Mellon University sent an alert over the Internet notifying users of two security holes in some versions of sendmail, the Unix electronic message routing software.

One flaw, located in the sendmail debug option (-d), could enable an intruder to gain root access, effectively obtaining complete administrative control of the computer. The other, located in the error-message header option (-oE), could enable a user to read any file on the system.

Both vulnerabilities were discovered recently in the intruder community, the CERT said. An exploitation script has been circulated for sendmail -d, and intruders are actively exploiting this vulnerability, said Moira J. West, technical coordinator at CERT. However, as of last week the CERT had not received reports of the sendmail -oE vulnerability being exploited, she said.

West declined to be more specific, citing a CERT policy against providing information on who has been affected by security breaches and how vulnerabilities are exploited.

Tiptoe through the Unix patch

Sendmail has security problems in many vendors' versions of Unix

VENDOR	STATUS
Eric Allman (sendmail pioneer)	Versions 8.6.8 and 8.6.9 not vulnerable
Amdahl	Not vulnerable
Apple	Patch available
Berkeley Software Design	Patch available
Convex	OS 11.0 not vulnerable; patch available for 10.x
Data General	Patch available
Digital	Patch available
Hewlett-Packard	Patch available
IBM	Patch available
Open Software Foundation	Patch available
Sun Microsystems	Patch available
The Santa Cruz Operation	Patch in progress

Source: Computer Emergency Response Team, Software Engineering Institute, Carnegie-Mellon University, Pittsburgh

"What users need to know is whether their version is vulnerable or not," West said. "And we encourage them to go and speak with their vendor about how to protect themselves."

Taking precautions

Tim Brooks, technical specialist for electronic-mail systems at Unipalm Ltd., a vendor of Unix connectivity software in Cambridge, England, pointed out that the security holes can only be exploited by someone logged on to the system, usually from a local terminal. Therefore, companies with presumably honest employees have little to fear, he said.

"However, universities may be a different story because undergraduates are great for trying to break the system if they can," Brooks added.

Brooks said sendmail is generally "a very reliable, very secure application." Sendmail has been around as long as Unix and has generally proved reliable — occasional glitches notwithstanding, he said.

The CERT advised obtaining a software patch for the security holes from the appropriate vendor. The list of vendors and the availability of software patches is in the "CA-94.12.README" file, which, with the CERT advisory, is available by anonymous file transfer protocol from info.cert.org.

IRS cracks down on fraud

Systemwide overhaul planned

By Gary H. Anthes
WASHINGTON

Since 1989, the Internal Revenue Service has investigated 1,300 employees for suspected violations of security and privacy in the primary computer system used for processing tax returns, Sen. John Glenn (D-Ohio) revealed last week.

At a congressional hearing chaired by Glenn, members of the Senate Committee on Governmental Affairs expressed outrage at the number of people implicated, which is far more than the 368 IRS employees reportedly under investigation a year ago for snooping through the computerized tax accounts of friends, relatives, neighbors and celebrities [CW, Aug. 9, 1993].

IRS officials testified that the agency's $8 billion systems overhaul would go a long way toward solving security weaknesses. "The systemic solution to safeguarding taxpayer information is found in tax systems modernization," said IRS Commissioner Margaret Milner Richardson.

Also to blame

But others suggested the IRS' security problems may lie more in lax management practices than in antiquated systems. "This is not about technology; it's about standards of accountability," said information security expert Robert D. Steele, president of Open Source Solutions, Inc., a nonprofit educational foundation in Oakton, Va. "Managers are not being held accountable for ethics. There is no cost to the manager for failing to protect privacy."

Indeed Richardson agreed with committee members' charges that the IRS has been too lenient with employees caught snooping through tax files.

IRS Commissioner Margaret Richardson: *New systems will ease fraud detection*

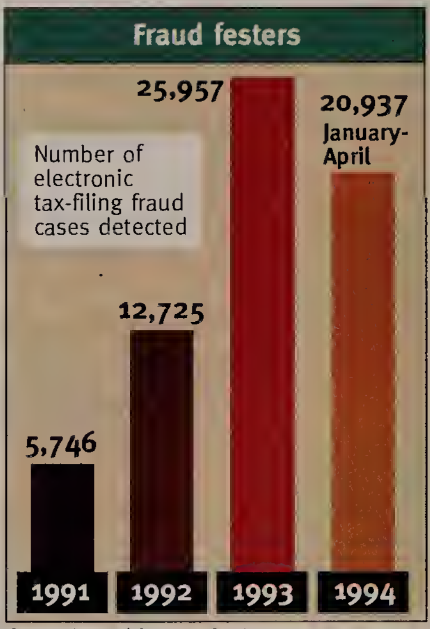
The IRS' problems are not just internal, however. Last week, the U.S. General Accounting Office (GAO) reported a sharp rise in the number of fraud attempts in the IRS' electronic filing program (see chart). "The growth rate of [fraudulent] returns is very high, but it is unclear how much of the growth is due to an increase in fraudulent activity rather than an improvement in fraud detection," said James F. Hinchman, a special assistant at the GAO. "Even more troubling is the uncertainty as to how much fraud might be going undetected."

Earlier attempts

In his testimony, Hinchman said the IRS implemented an experimental system in 1990 without building in strong edit-and-validation rules. For example, the system did not match taxpayers' names and Social Security numbers on electronic returns with internal IRS records. That oversight has been corrected, resulting in the rejection of 200,000 returns this year, but he said the system still needs stronger validity checks.

The IRS is taking vigorous steps to automate fraud detection, such as working with computer scientists at Los Alamos National Laboratory to develop artificial intelligence techniques for spotting suspicious returns, Richardson said.

"As we continue to identify the items on returns that are predictive of fraud, we will move these 'filters' to the front of our processing system," she said. The IRS plans to install a new "electronic fraud detection system" next year, but Richardson said its "filter" criteria would not be disclosed.



Source: Internal Revenue Service

In the new systems, more taxpayer and tax-return data will be available on-line, and more documents will be matched and validated against one another, making it easier to catch fraud before refunds are made, Richardson said.

She said the agency's new systems will also include the following:

- "Near-real-time alarm systems" to alert system administrators of potential security violations.
- "Security profiles" that specify each employee's access to each system.
- New work load management techniques that assign cases based on skill levels and security authorizations.
- Identification techniques for taxpayers, such as smart cards and personal identification numbers.

"I do not believe that the agency currently has the capacity or technology to catch most refund schemes," Glenn said. "[But] advanced technology has allowed schemers to virtually automate the filing of fraudulent returns."

Deadly blow

If the IRS' tax system modernization program holds the key to solving its security problems, as the agency asserts, then security may soon be dealt a sharp blow. Lawmakers have vowed big cuts in the IRS' proposed 1995 budget to overhaul its antiquated systems.

Larry Westfall, the IRS executive managing the program, expressed his concern and disappointment that Congress would cut technology investments "[in] the principal profit center of government." The IRS takes in more than 90% of government revenue.

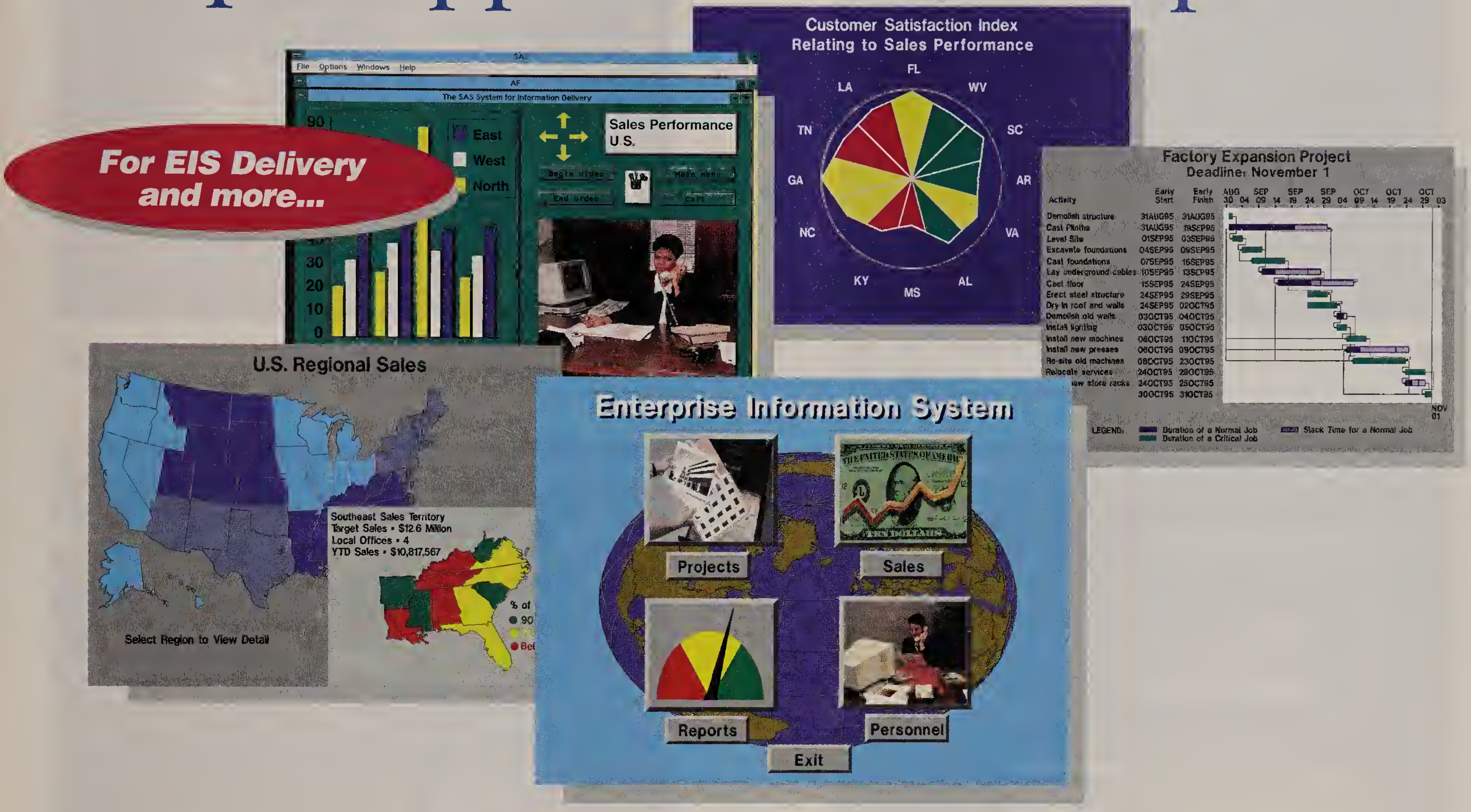
Toward that end, the House of Representatives recently voted to chop $517 million from the $989 million the agency had sought for systems modernization next year.

The Senate, meanwhile, is considering a $385 million cut. The final cut is being worked out in a House/Senate conference.

Westfall said the cuts could delay or scale back the implementation of new case-processing systems, the rollout of a $1.3 billion document imaging system [CW, March 7] and the purchase of mainframes for on-line tax account information.

"Through these . . . projects, the IRS will be able to make . . . significant inroads in our fight against fraud," said IRS Commissioner Margaret Milner Richardson. "[That can not be done], however, if funding for these projects is delayed or not available." *—Mitch Betts*

Client/Server Rapid Applications Development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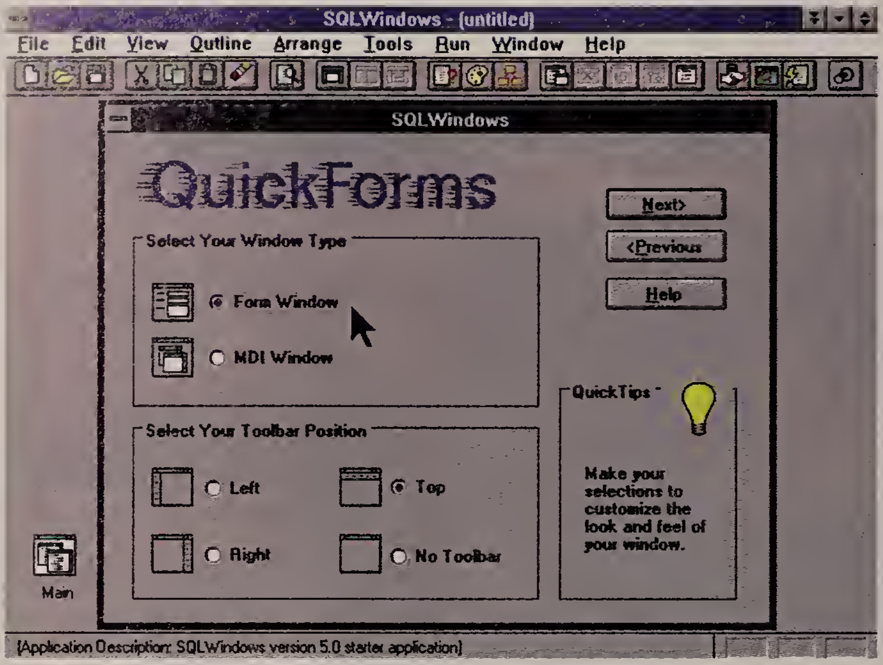
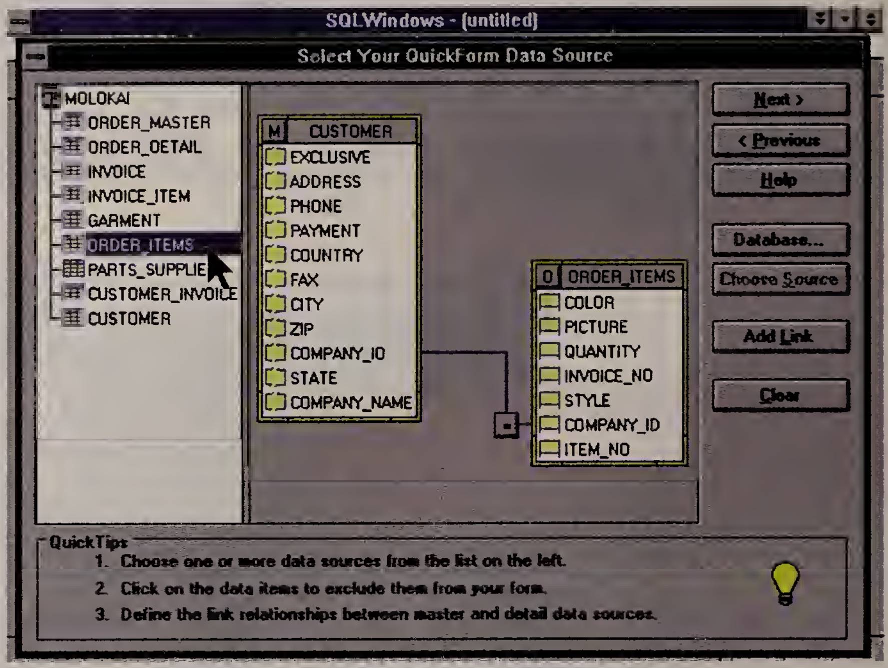

SQLWindows - [untitled]
File Edit View Outline Arrange Tools Run Window Help
SQLWindows
QuickForms
Next>
<Previous
Help
Select Your Window Type
Form Window
MDI Window
Select Your Toolbar Position
Left
Top
Right
No Toolbar
QuickTips
Main

Make your selections to customize the look and feel of your window.

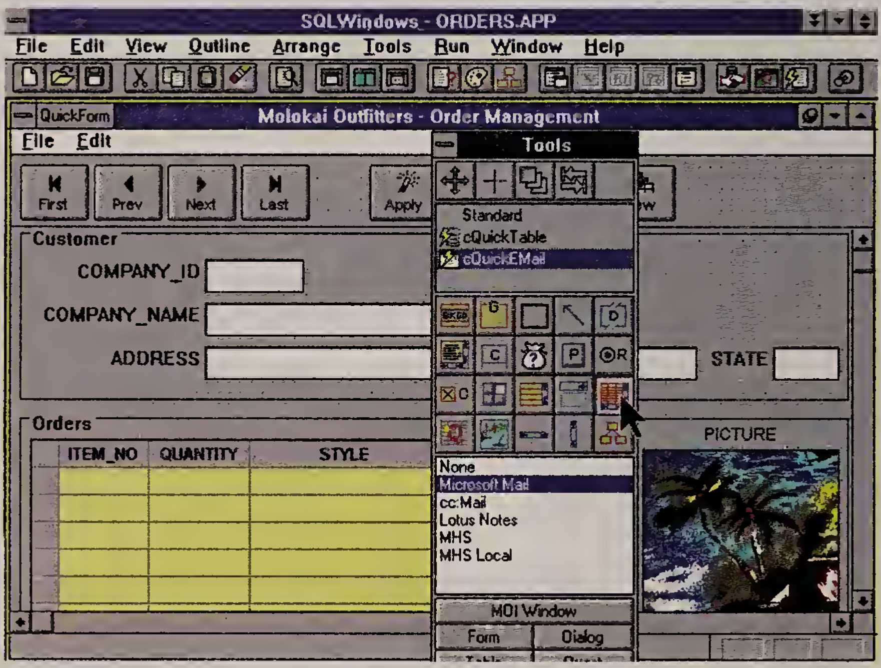
{Application Description: SQLWindows version 5.0 starter application}

1 Relax and take a deep breath. SQLWindows® is your quickest way to build and deploy problem-solving applications just like this one. For the quickest start, choose a QuickForm to lay out your application and make all the appropriate connections.


SQLWindows - [untitled]
Select Your QuickForm Data Source
MOLOKAI
ORDER_MASTER
ORDER_DETAIL
INVOICE
INVOICE_ITEM
GARMENT
ORDER_ITEMS
PARTS_SUPPLIE
CUSTOMER_INVOICE
CUSTOMER
M CUSTOMER
EXCLUSIVE
ADDRESS
PHONE
PAYMENT
COUNTRY
FAX
CITY
ZIP
COMPANY_ID
STATE
COMPANY_NAME
D ORDER_ITEMS
COLOR
PICTURE
QUANTITY
INVOICE_NO
STYLE
COMPANY_ID
ITEM_NO
Next >
< Previous
Help
Database...
Choose Source
Add Link
Clear
QuickTips

1. Choose one or more data sources from the list on the left.
2. Click on the data items to exclude them from your form.
3. Define the link relationships between master and detail data sources.

2 QuickForms let you choose data from any database, identify fields and automatically create master detail links. A simple button click generates your QuickForm. By the way, xBASE and Paradox® data drivers are included to help desktop developers move up.


SQLWindows - ORDERS.APP
File Edit View Outline Arrange Tools Run Window Help
QuickForm
Molokai Outfitters - Order Management
File Edit
Tools
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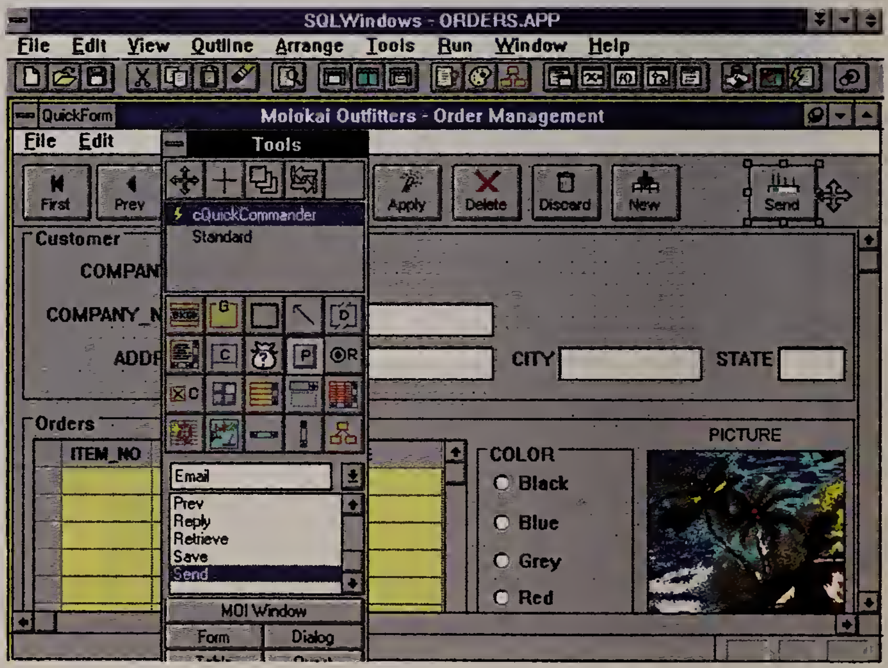
Prev
Next
Last
Apply
Standard
cQuickTable
cQuickEMail
Customer
COMPANY_ID
COMPANY_NAME
ADDRESS
STATE
Orders
ITEM_NO
QUANTITY
STYLE
PICTURE
None
Microsoft Mail
cc:Mail
Lotus Notes
MHS
MHS Local
MDI Window
Form
Dialog

5 Painless workgroup integration is just a point-and-click away. Select the QuickEmail object, choose your mail system from the options listed and drop an e-mail data source into your form. Now users anywhere on the network can be notified when an order affects them or requires some action on their part.


SQLWindows - ORDERS.APP
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Molokai Outfitters - Order Management
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Customer
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COMPANY_N
ADDR
CITY
STATE
Orders
ITEM_NO
Email
Prev
Reply
Retrieve
Save
Send
COLOR
Black
Blue
Grey
Red
PICTURE
MDI Window
Form
Dialog

6 For instance, each order will require credit approval. This calls for an e-mail QuickObject, a pre-defined pushbutton with built-in code to execute e-mail tasks. To run credit checks via e-mail, choose the "Send" e-mail QuickObject and drop a "Send" button on your form's toolbar. Now any user of the application will be able to notify the Credit Department when an order is placed and secure their approval to ship — all via e-mail without leaving the application.

How QuickObjects Molokai from

INTRODUCING
SQLWindows 5.0

When Molokai Outfitters opened their new branch warehouse, QuickObjects from Gupta kept their finger off the panic button. Only available in SQLWindows 5.0, QuickObjects made sure Molokai's critical sales order entry application got delivered in a flash!

Quickly build powerful client/server applications.

Now, client/server applications are in your grasp. New QuickObjects from Gupta make "drag & drop" application development a productive programming alternative to dreary, repetitive coding. In fact, any developer can now build full-featured client/server applications regardless of prior experience. Novices can skip complicated coding and veteran developers can boost productivity before resorting to code for extended functionality.

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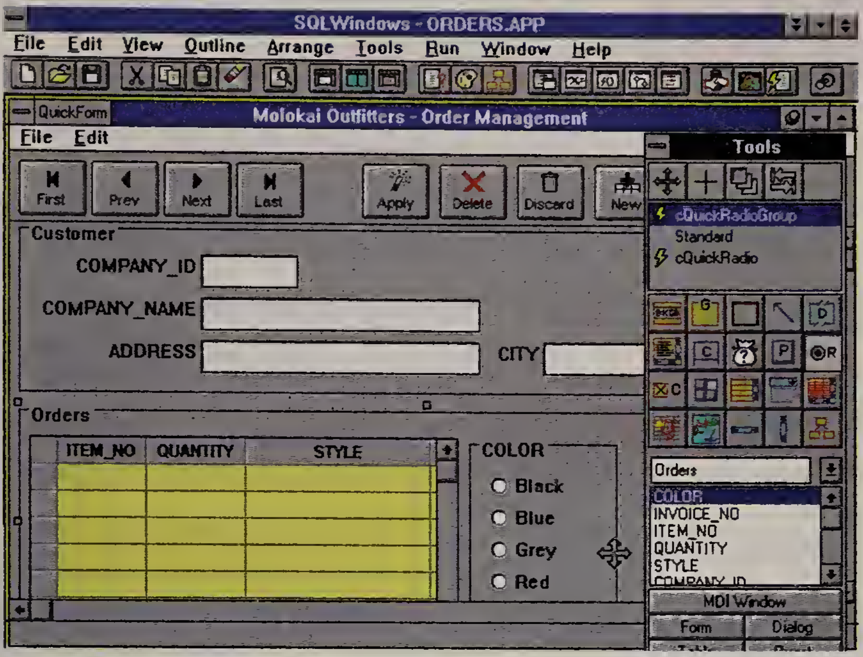
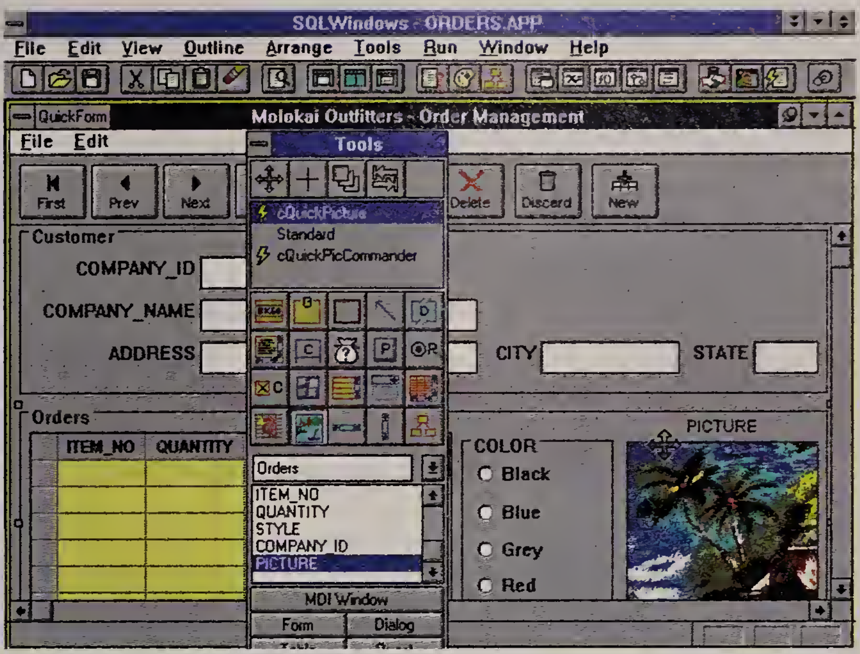

SQLWindows - ORDERS.APP
File Edit View Outline Arrange Tools Run Window Help
Molokai Outfitters - Order Management
QuickForm
Tools
First Prev Next Last Apply Delete Discard New
cQuickRadioGroup
Standard
cQuickRadio
Customer
COMPANY_ID
COMPANY_NAME
ADDRESS
CITY
Orders
ITEM_NO QUANTITY STYLE
COLOR
Black
Blue
Grey
Red
Orders
COLOR
INVOICE_NO
ITEM_NO
QUANTITY
STYLE
MDI Window
Form
Dialog

3 Next, customize your QuickForm by choosing QuickObjects from the tools palette. Each QuickObject chosen will be automatically linked to your data sources. In this case, just drag and drop a QuickRadioGroup so users can select shirt colors with intuitive radio buttons.


SQLWindows - ORDERS.APP
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Molokai Outfitters - Order Management
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First Prev Next Delete Discard New
cQuickPicture
Standard
cQuickPicCommander
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ITEM_NO QUANTITY
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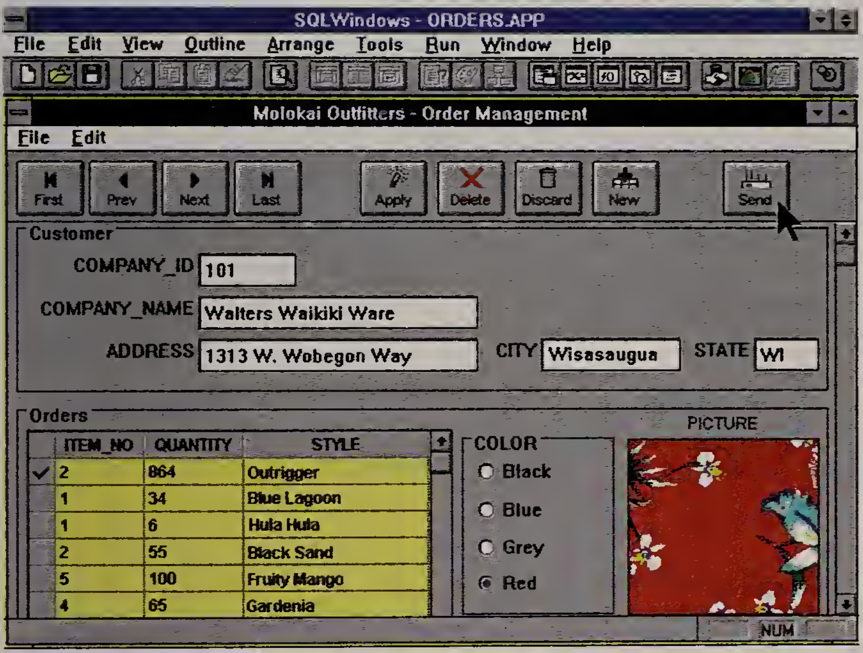
COLOR
Black
Blue
Grey
Red
Orders
ITEM_NO
QUANTITY
STYLE
COMPANY_ID
PICTURE
MDI Window
Form
Dialog

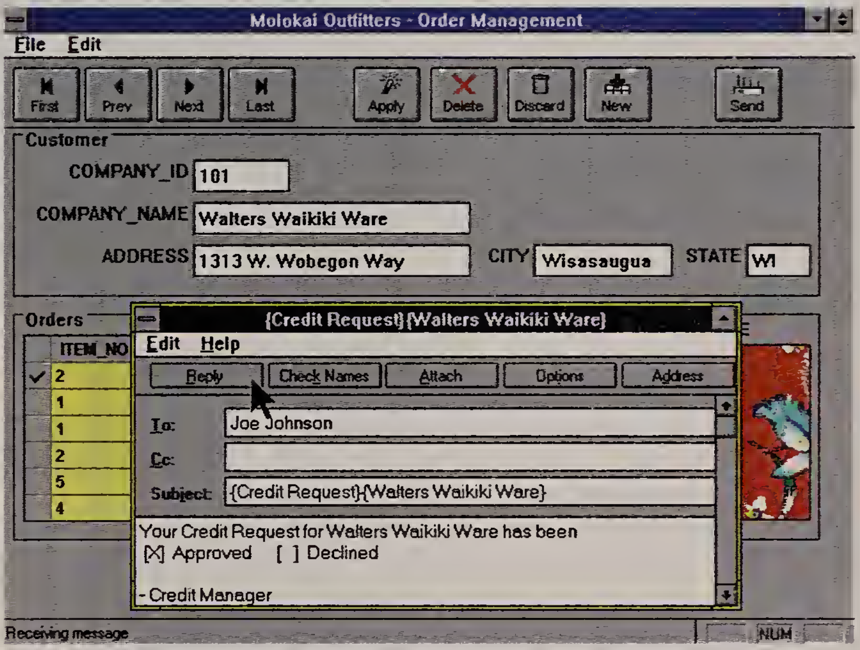
4 What good are color selections in a Hawaiian shirt company if your can't see them? SQLWindows applications can easily incorporate graphical data from any file, OLE server or database, with the QuickPicture QuickObject. Just place and size the picture box in your form. See? You still haven't written a lick of code!


SQLWindows - ORDERS.APP
File Edit View Outline Arrange Tools Run Window Help
Molokai Outfitters - Order Management
File Edit
First Prev Next Last Apply Delete Discard New Send
Customer
Orders
PICTURE
COLOR
○ Black
○ Blue
○ Grey
● Red
NUM

COMPANY_ID 101
COMPANY_NAME Walters Waikiki Ware
ADDRESS 1313 W. Wobegon Way
CITY Wisasaugua
STATE WI

	ITEM_NO	QUANTITY	STYLE
✓	2	864	Outrigger
	1	34	Blue Lagoon
	1	6	Hula Hula
	2	55	Black Sand
	5	100	Fruity Mango
	4	65	Gardenia

7 Now, test your application. Click on the "Run" button in the SQLWindows toolbar. Any errors will be flagged by the internal debugger and a runtime application will be created. Then, for blazing speed, just punch the adjacent SQLWindows Compiler button to tap the performance of the industry's first 4GL compiler.


Molokai Outfitters - Order Management
File Edit
First Prev Next Last Apply Delete Discard New Send
Customer
Orders
ITEM_NO
{Credit Request}{Walters Waikiki Ware}
Edit Help
Reply
Check Names
Attach
Options
Address
Receiving message
NUM

COMPANY_ID 101
COMPANY_NAME Walters Waikiki Ware
ADDRESS 1313 W. Wobegon Way
CITY Wisasaugua
STATE WI

ITEM_NO: ✓ 2, 1, 1, 2, 5, 4

To: Joe Johnson
Cc:
Subject: {Credit Request}{Walters Waikiki Ware}

Your Credit Request for Walters Waikiki Ware has been
[X] Approved [ ] Declined

- Credit Manager

8 Congratulations. You've just built a powerful client/server, mail-enabled application that integrates graphical and SQL data anyone can use. And you did it in less than 15 minutes! Now, *Walter's Waikiki Ware* in Wisconsin will get the 72 dozen Outrigger shirts they need by next week and you'll be modeling Molokai Outfitters' latest styles on the very beaches that inspired them.

from Gupta kept
losing its shirt.

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Briefs

Sybase stock drops

Though **Sybase, Inc.** posted its most profitable quarter ever last week, Wall Street sent its stock down 8 3/4 points from 48½ to 39¾. That may be because license revenue for SQL Server was 49% of total revenue for the quarter, the first time it has ever dropped below 50%. But pure license revenue — excluding service and support fees — for SQL Server still topped $107 million, growing 64% over last year's $65 million for the second quarter. Sybase's sales figures for its fiscal second quarter jumped 64% to $158.1 million from the $96.3 million in sales reported for that period last year, and profits rose to $15.7 million.

Micrografx shuffles

J. Paul Grayson, co-founder and chairman of the board at graphics developer **Micrografx, Inc.**, has replaced Gordon Tucker as president and chief executive officer. The board cited philosophical differences over leadership in replacing Tucker, who served less than a year. Grayson previously served as CEO from the company's inception in 1982 until October 1993.

CompuAdd sold

Dimeling, Screibner & Park, a private investment partnership in Philadelphia, will acquire **CompuAdd Computer Corp.**, an Austin, Texas, manufacturer of PCs and retail point-of-sale systems, pending final negotiations. The agreement will retain CompuAdd's management, employees, product strategies and customer support programs. CompuAdd filed for Chapter 11 bankruptcy protection in June 1993 and emerged with a reorganization plan to turn over most of the company to unsecured creditors until a buyer was found.

[illegible] **MicroNet Technology Corp.** will acquire the MacinStor storage line from **Storage Dimensions Inc.** in Milpitas, Calif.

Consolidation seen in tools, RDBMS markets

Oracle/Gupta relationship may portend growing trend

By Melinda-Carol Ballou and Kim S. Nash

An on-again, off-again, unsolicited bid by Oracle Corp. to acquire struggling Gupta Corp. typifies a trend toward consolidation in the relational database and low-end client/server tools markets, according to industry analysts.

After Oracle bought 7.7% of Gupta's stock over the past month and a half, the two companies last week began discussing a closer relationship.

Then, almost immediately, Oracle turned around and sold 5.7% of its Gupta stake last Tuesday and Wednesday, according to documents filed with the Securities and Exchange Commission.

"Oracle has not formulated any plans [that] would result in . . . an extraordinary corporate transaction involving" Gupta, the filing said. However, the possibility of a takeover, among other moves, lingers. "Oracle reserves the right . . . to take . . . such actions," the document said.

Hand in hand

Vendors seek to pull in the desktop market by combining client/server tools with low-end single-user databases

VENDORS	DATABASE	C/S TOOLS (LOW-END)
COMPUTER ASSOCIATES	OPENINGRES	OPENROAD 4GL
ORACLE	GUPTA'S SQLBASE SERVER*	SQLWINDOWS SOLO*
SYBASE	SQL SERVER	BUILD MOMENTUM**
MICROSOFT	ACCESS AND SQL SERVER	VISUAL BASIC
POWERSOFT	WATCOM	POWERBUILDER DESKTOP
KNOWLEDGEWARE	SQLBASE	OBJECTVIEW DESKTOP

*Under discussion **Unreleased

"We are continuing discussions [with Gupta] about potential business alliances," an Oracle spokesman said, declining further comment.

A good buy

According to Oracle officials, the company acquired the Gupta stock because it represented an "attractive investment opportunity." Gupta officials acknowledged the talks but refused further comment.

Although Gupta executives may not be pleased by Oracle's zigzagging moves, they have no choice but to consider any offers, analysts said. Their losses this quarter included a shortfall of roughly $7.5 million, and a loss is also expected for the next quarter.

Industry analysts said such losses are a by-product of the overcrowded market and that a winnowing out process is likely to occur during the next two years.

"One by one, I expect the tool vendors will either be bought out or go out of business except for a few niche players," said Richard Finkelstein, president of Performance Computing in Chicago.

A prime example of this trend, according to analysts, is Computer Associates International, Inc.'s acquisition of The ASK Group, Inc. last month.

There were 31 similar deals in 1993, up from 24 in 1992, according to Broadview Associates, a consulting firm in San Mateo, Calif., that specializes in mergers and acquisitions.

"Customers in general have to be very careful about which product and which vendor they will be using over the next two to three years so they won't be stuck with technology that just disappears," Finkelstein said.

Performance boost

Oracle could well use Gupta's client/server SQLWindows tools and the smaller footprint of Gupta's SQLBase database to help it compete at the low end, analysts said. Microsoft Corp. has been sniping at Oracle, making it critical for Oracle to address this market, they added.

Quick killing

When it sold 635,000 of its 937,500 shares of Gupta stock last week, Oracle recouped more than $8.4 million of the $9.9 million it had spent buying the stock since June 10.

Client/server tools market leader Powersoft Corp. also offers a single-user database, which the company inherited when it bought Watcom International last year.

Even Powersoft may not be immune to a possible shakeout that began with price wars initiated by Microsoft, which low-balled Visual Basic prices a year ago.

As the number of players dwindles, the "big unknown" will be what will happen when object-oriented technology takes off since most tools currently available in this market "don't really support it," said Rich Edwards, a senior analyst at Robertson, Stephens & Co., an investment bank in San Francisco.

Brooktrout hit with countersuit in battle over fax routing patent

By Lynda Radosevich

Two dominant computer fax vendors are engaged in a legal tussle over rights to a routing technique that has been used in corporate LAN fax systems and value-added fax services for roughly five years.

GammaLink, a Sunnyvale, Calif., subsidiary of Dialogic Corp., last week said it is countersuing Brooktrout Technology, Inc. in Needham, Mass., over a patent infringement claim.

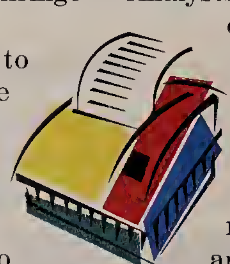
At issue is a U.S. patent awarded to Brooktrout in March that covers the use of Direct Inward Dialing (DID) telephone services with computer-based fax systems.

DID technology enables several telephone numbers to be assigned to a single phone line attached to a fax server. Faxes sent to the server can be forwarded to addressees' electronic mailboxes. The method eliminates the need for manual fax delivery.

Pete Davidson, president of Davidson Consulting in Burbank, Calif., said the current penetration of fax technology on corporate LANs is less than 5%. However, he estimated worldwide fax server revenue will grow from $210 million in 1994 to $1.1 billion in 1998.

Two weeks after receiving the patent, Brooktrout filed a patent infringement suit against GammaLink. GammaLink now claims Brooktrout's patent is invalid because prior examples of the technology already existed. GammaLink also claims that Brooktrout is trying to stifle the industry by imposing licensing fees.

Impetus behind move



Analysts said GammaLink launched its countersuit now because it discovered the prior examples and because it was recently bought by Dialogic, which has the money to file a countersuit.

"The patent office has been remiss in doing its job" because it apparently did not find prior evidence of the technology, said Jerry Brodsky, president of the American Facsimile Association in Philadelphia.

Brooktrout President Eric Giler said the impact on the industry will be minor because the company will license the technology for a nominal fee. He would not say what that fee will be. Analysts estimated the amount to be 1.5% to 3.5% of sales and said such a fee is not high enough to disrupt the market.

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SPECInt92	124.0 per CPU	108.8 per CPU	60.3	97.6
I/O (MB/sec.)	132	32	32	80
INTERNAL RAID	Yes	No	No	No
ENTRY PRICE (US $)	$26,900	$76,000	$46,700	$66,400

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Editorial

The mouths that roared

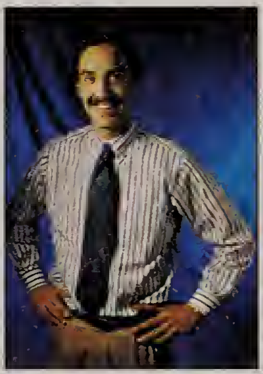
CONTINUED FROM PAGE 1

It's as though they called Bill Gates into the street at high noon, surrounded him with hired guns from Europe and Washington, stood nose to nose . . . and blinked. According to one source deep within Microsoft, the final agreement, which the Justice Department said was hammered out in the wee hours, was identical to what Microsoft put on the table a month ago. What remained from that point, possibly, was the government's figuring out how to put the right spin on this nonevent.

If there is one thing the Justice Department's revel shows, it is a profound lack of understanding of the business and marketplace it claims to have rescued from the evils of monopoly.

Microsoft's success has precious little to do with the fact that some hardware makers paid, and therefore passed on to consumers, royalties to Microsoft for PCs sold without Microsoft products loaded on them. The five-year cost of ownership of a PC in today's client/server world is more than $30,000. Does anyone believe that a corporate user would standardize on IBM's OS/2 or Novell's DR-DOS instead of Windows to save $40 per PC on a royalty payment?

Still, instead of tackling the really tough issues, the Justice Department picked the low-hanging fruit. Nowadays, Microsoft's cash cows are its applications. Its Windows word processing market share is 50%; its spreadsheet share is even higher.



In the pre-Windows world, Lotus had more than 70% of the spreadsheet market, and WordPerfect had about 65% of word processing sales. One might conclude that Microsoft's ownership of the MS-DOS and Windows environments gave the company unfair advantages in developing Windows applications. Or you could naively conclude that Microsoft just got real good real fast. But the Justice Department didn't touch that because, Bingaman said, "the issue was not legally supportable."

What about attacking Microsoft's notorious practice of announcing products it doesn't have, thus freezing sales of its competitors' existing products? That's probably another legally insupportable issue.

But the most telling remark from the Justice Department came in response to the question about why Windows NT was not included in the settlement. "That's because Microsoft does not have monopoly power in Windows NT right now," Bingaman said.

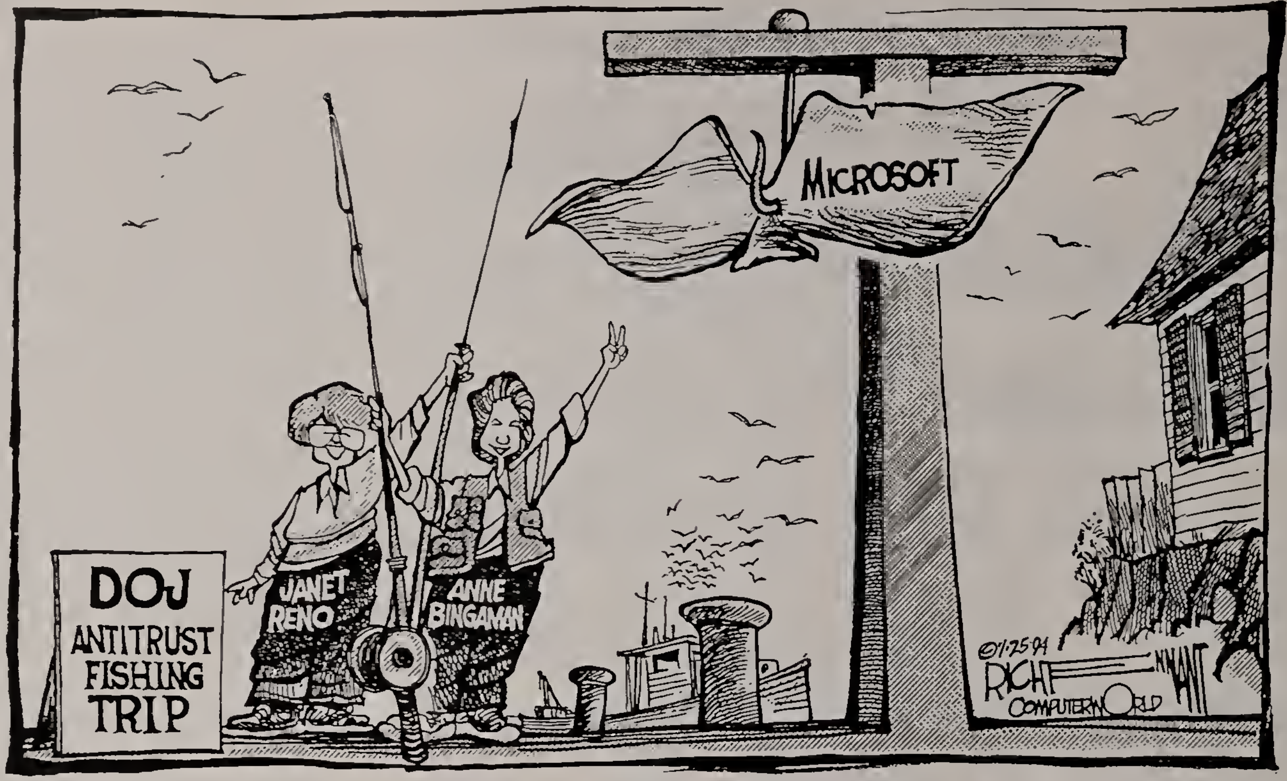
Ah. This seems to say, "Just wait 'til the horses are out of the barn on that one. We'll be down on Microsoft like a ton of feathers!" The Justice Department will once again level the playing field, even though there may be only one player left.

Somehow, Microsoft became another symbol in Washington of those horrid excesses of the 1980s, a target for the politically correct set. The fact is that Microsoft's success, certainly the vast majority of it, was derived from its customers and their buying preferences. Microsoft exploited that success, perhaps questionably, with its unique ownership of the desktop operating environment.

For the Justice Department, this is a Pyrrhic victory in the truest sense.

Bill Laberis

Bill Laberis, *Editor in Chief*



Letters to the editor

IBM isn't saying 'so long' to CC:Mail

In "So long, CC:Mail" [CW, July 11], the subheadline, "IBM drops resale of product," is incorrect. IBM currently resells and will continue to resell CC:Mail as a standalone product, as part of SmartSuite for OS/2 and as part of our ThinkPad bundle.

Richard J. Sullivan
Division Director, Workgroup Solutions Marketing
IBM
Somers, N.Y.

Editor's note: As told to Computerworld *by IBM, the company will now directly compete with CC:Mail and will halt its 5-year-old policy of proactively marketing CC:Mail systems.*

'Junk' mail

The backgrounds of the two contributors to "Junk my mainframe?" [CW, May 30] told me all I needed to know about why they take their respective positions.

Joe Vincent described his "average mainframe shop" as processing 7.3 million transactions per day on more than 1.4T bytes of data. L. John Severson mentioned only "hundreds of thousands of transactions per day." Clearly, the two shops differ by at least an order of magnitude.

Rather than treat the issue as having a single "right" solution, why not acknowledge that some problems are better solved with a PC LAN, such as two people sharing a 1,000-record mailing list, and that some are better solved with mainframes? Then you could get on with the service to your readers, which is identifying where the cutoff between the two solutions occurs.

Roy Brander
Calgary, Alberta

The mainframe, with its high-performance storage components and networking capabilities, is the only solution capable of acting as a repository for huge amounts of data, especially image and voice. The PC in a client/server environment is the best solution to process this data for departmental applications such as spreadsheets and word processing.

Because the key to corporate success is rapid access to business data, it only makes sense to combine all of these products in one system in which the mainframe acts as an index and traffic cop for data requests, regardless of whether the data resides on the mainframe or the PC.

Robert Wintermeier
Croton-on-Hudson, N.Y.

I must congratulate you on an excellent choice of contrast for "Junk my mainframe?" It is too bad that so many techno-followers get so much press and so few solid business types are heard from.

L. John Severson hasn't junked his mainframe; he has only moved it out of sight. More than that, he has nothing to show on the other side except plans and dreams. It would be interesting to know who still has his job in three years, Severson or Joe Vincent. My money would be on Vincent.

L. B. Andres
Saskatoon, Saskatchewan

Some of us aren't kids

I am amazed that *Computerworld* would print a biased, knee-jerk article such as "Ability to baffle consulting" [CW, June 20].

I find it hard to believe that a person who has attained a position such as senior analyst could not use his analyst skills to determine whether a consulting firm is reputable.

I was in the computer business 10 years before I became a consultant. Most consultants with whom I work are in the 10- to 15-year range, and most of us are quite conservative about the ills we can cure. Mr. Lynch, forgive me if I seem harsh, but all consultants are not college kids.

Harold McCullough
Colorado Springs

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Freeze upgrades to unleash users

Ben Rothke

What is dynamic about the nature of the software industry is that there is a never-ending cycle of upgrades. From DOS 3 to DOS 6, WordPerfect for DOS to WordPerfect for Windows, Windows 286 to Windows NT and so on. Many say the beauty of this technical development is that we now have tools to make our jobs easier and more productive. But this constant upgrade cycle may do more harm than good.

I believe the PC industry is infected and tainted with Babbage Disease, which is named after the 19th century inventor and mathematician Charles Babbage.

The disease in its current incarnation is the obsession to perfect hardware and software, blacking out practical concerns such as getting a job done. Charles Babbage himself died a failure, having deserted his many half-finished projects for the alluring illusions of greater challenges.

An additional manifestation of Babbage Disease is that IS managers feel any type of software upgrade is a direct call from the Supreme Being. That leaves end users caught in endless learning cycles, never perfecting their computing techniques in time to use an application to its maximum potential. The entire computer industry is moving so fast and reinventing itself so often that today's novelties are tomorrow's depreciations.

Give users five years to work with the same software and imagine how well they will learn it.

Lotus, Microsoft, WordPerfect and Borland have spent millions of advertising dollars promoting their suites of software applications. Irrespective of which vendor one chooses to buy a suite from, the suites have enough potential and power to sustain 85% of the end-user populace for the next 10 years. Unless someone works at Fermilab or is a researcher at Cal-Tech, the software suites have all the necessities that an end user needs and more.

Imagine how much a company's productivity would increase if it bought end users a copy of Microsoft Office today and didn't buy them any more software for five years. The end users would have the time and peace of mind to master the applications they need. They would also have a core group of end users around them who could answer their technical questions. They would not have to worry about constantly changing packages, upgrades, inconsistencies, formats and so on. The people at the help desk would not be as inundated. It would be a win/win situation.

Of course Microsoft and friends wouldn't like this idea because software upgrades are a key way to increase revenue. But eliminating the number of software upgrades will upgrade the PC from a toy to a true work tool. Users will do real work with Windows rather than play solitaire.

Until the IS industry dislodges itself from the numerous symptoms and variations of Babbage Disease and starts real achievements, these machines we call PCs, workstations or personal digital assistants will simply be an electronic deck of cards.

Rothke is network manager at Track Data Corp. in New York. He can be reached by CompuServe at 74710,3325.

Summertime and telecommuting can be easy

Patricia B. Seybold

There are two things that are hard about telecommuting. One is the invisibility factor. The other is the communications chasm. However, both can be overcome, but only with trust and time.

You don't become a successful telecommuter overnight, and your company is unlikely to assimilate telecommuting overnight. In our case, it's taken about three years,which is about right for any organizational behavioral change. This is the third summer I've worked from my summer place in Maine, and I am on the road for most of the rest of the year.

The invisibility factor cuts both ways. If they don't see you working, they resent you. You pick up that resentment by osmosis, and you begin to feel guilty every time you take a break, go for a walk or spend an hour in the garden. Over time, you all begin to loosen up — the folks in the office and the person working at home — and you realize that as long as the quality of work is high, how and when you choose to do it is probably irrelevant. (Personally, most of my best ideas come when I'm weeding the garden.)

This resentment/guilt factor is deeply rooted. It stems from a basic misapprehension that the quality of your work is measured by the hours you put into it. If you are perceived to be working hard (even if you are shuffling papers ineffectually at a desk), you are likely to win more brownie points than the unseen person who excels in producing excellent work in less time and with less effort. In our organization, we're finally beginning to reward people who are the most creative and effective with the least amount of time, struggle and effort!

The communications chasm is equally difficult to bridge. We rely so much on social cues and social interactions to cement and maintain our relationships that when these are missing or relegated to one or two communications media (electronic mail and voice mail, for example), things go awry. The first symptom is flaming. The absent party sends an innocuous or an impassioned message that immediately reverberates throughout the organization.

You don't become a successful telecommuter overnight, and your company is unlikely to assimilate telecommuting overnight.

For example, the first summer I worked outside the office, I innocently sent out my bright ideas each night. By 9:30 a.m. every morning, the office was in an uproar. By 11 a.m., I was getting phone calls from concerned and outraged co-workers. After sorting out the misunderstandings, I'd crawl into my cocoon and become uncommunicative for a few days. Then the cycle would start again. By the second summer, I had learned how to better couch my suggestions so that my co-workers would receive them in the spirit in which they were intended.

Now, at least half of our staff are telecommuters. There is no stigma attached. What works for us is creating a lot of context. We use Lotus' Notes to document everything we do. All work in progress, brainstorms and feedback take place in Notes databases so the contributions each person is making — directly and indirectly — in the context of their assigned projects or tasks can be seen. We all have copies of our customer database in our laptops and in a relational database management system. So everyone in the company has up-to-date and accurate customer information no matter where they happen to be on the planet.

The moral of the story is that absence doesn't make the organizational heart grow fonder, but context-full communications does. If you can succeed in creating a shared mental model of your work together, you'll be successful in bridging the obstacles to telecommuting.

Seybold is president of Patricia Seybold Group in Boston. Her Notes address is Patricia Seybold@PSOCG. Her Internet address is PSeybold@PSGroup.com.

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Industry changes

Luggable market continues its slide

By Michael Fitzgerald

Compaq Computer Corp.'s recent decision to stop making the Portable 486 family luggable PC is just the latest sign that the market for luggables is waning faster than some analysts had expected.

Only a year or so before it stopped making the Portable 486 family, Compaq had considered adding features to the platform [CW, Feb. 15, 1993]. With IBM out of the market for three years, Compaq's exit leaves Toshiba America Information Systems, Inc. as the last name player in the luggable arena. A Toshiba spokeswoman said the company intends to stay in this market for the foreseeable future.

Heavy heavy-duty

The luggable's aim has always been to provide desktop power and functionality in something movable. Meant for heavy-duty users such as field engineers or high-end presentation makers, the original Compaq portable, for instance, weighed 31 pounds, while today's tend to be in the 12- to 20-pound range. Notebooks average less than 7 pounds.

Luggables typically support faster processors, more disk storage and RAM than notebooks, but the key difference is that luggables have expansion slots.

The market appears to be shrinking rapidly. International Data Corp. (IDC) in Framingham, Mass., has scaled back its 1994 projections from more than 60,000 to 33,000 units and only 30,000 units next year. In early 1993, IDC had expected to see the market generate more than 60,000 units a year at least through 1996. Dataquest, Inc. in San Jose, Calif., projects a slower drop, but its numbers also show a decline.

The constant improvement of notebooks, which are nipping at the heels of desktop features, let alone luggables, caused IDC to revise its forecast.

"If you have SCSI built in to your notebook, and you can connect to a portable boom box with CD-ROM drive and speakers, what do you need a luggable for?" asked Ted Julian, an analyst at IDC.

Little big market

Luggable sales are falling fast as lighter notebooks eat up more and more of the portable market

Luggable units shipped (U.S.)	
1992	69,000
1993	41,000
1994	33,000*
1995	30,000*

*Projected

Source: International Data Corp., Framingham, Mass.

Still, "there'll always be a market for something with a slot," Julian said.

Volker Dolch, president and chief executive officer at luggable maker Dolch Computer Systems in Milpitas, Calif., agreed that the overall luggable market "is shrinking and is going to keep shrinking" but said the market for luggables that accept add-in cards will continue to grow.

Dolch, probably the largest player in the luggable market in terms of unit sales, is growing. The privately held company posted $27 million in sales for 1993, slightly less than the $30 million it projected in early 1993. Dolch said the company is on track to bring in $50 million this year.

Dolch said high-end sound boards and cards that compress and decompress video are typically used in luggables.

Not affected

Bermac Communications, Inc., an interactive multimedia developer in Dallas that uses Dolch as its platform, is not seeing its sales drop, according to Phil Chadwick, Bermac's executive vice president of marketing. Bermac sells a sales-force automation package that runs full-motion video.

"We're not seeing demand go down, but our application is rather specific, and [Dolch] seems to be the only game in town," Chadwick said. He added that Bermac might be interested in using notebooks as a platform, but full-motion Motion Picture Experts Group compression is difficult to accomplish in a notebook.

Pac Bell picks Microsoft

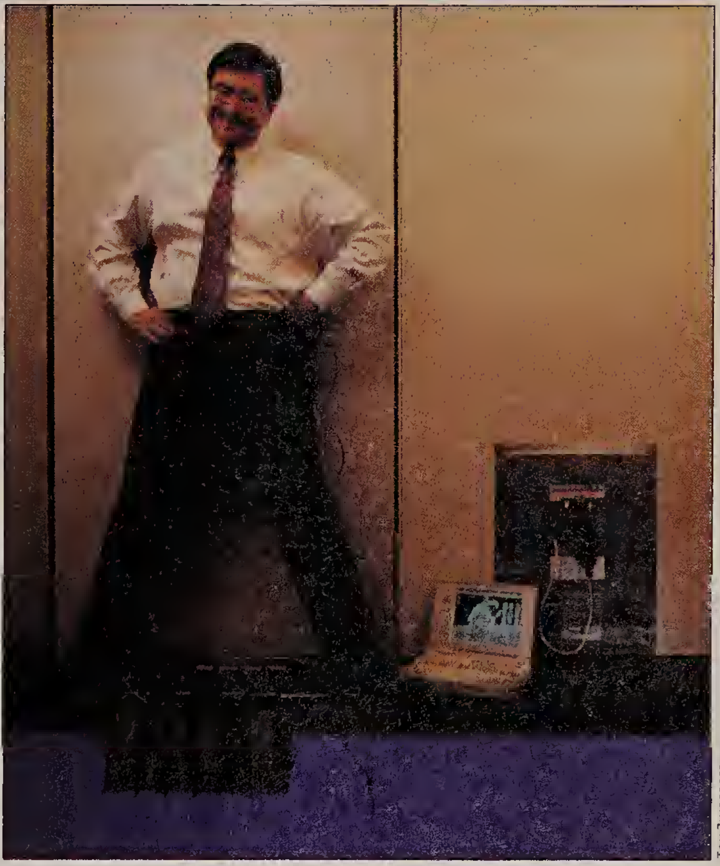
Auditing division goes with NT Advanced Server over OS/2

By Ed Scannell

■ As a technological role model for 20,000-plus PC users, Pacific Bell's Auditing Services Department knows something about how the canary in the coal mine feels.

Not only is the department responsible for seeing that the $10 billion company promptly and properly delivers products and services to 30 million Californians, but it also has the added pressure of implementing state-of-the-art technologies and strategies for the rest of the company to follow.

"Our job is to review all functions throughout the company to make sure services and products are delivered and satisfactory," said David Holcombe, director of the Auditing Services Department. "We sometimes push the technological envelope to do this, but we also have to be responsible by setting a good computing example for the other departments to follow."


TOM ZIMBEROFF

Pacific Bell's Warren Smith: *'Chicago appears to lessen the nightmares that keep LAN administrators up nights'*

Move to Microsoft

One of the more important decisions the auditing department has made lately is to gradually replace its UB Networks, Inc.'s Net/One networking software and IBM's OS/2 and LAN Server software with Microsoft Corp.'s Windows NT Advanced Server in the short term and Microsoft's Windows 4.0, commonly known as Chicago, in 1995. Chicago will also replace Windows 3.x on client systems.

This decision is expected to cause a ripple effect at Pacific Bell.

"You might say we let [the auditing department] perform the guinea pig role here in some of the new technologies we try because they tend to get involved with a lot of different products," said Warren James, a senior systems analyst at Pacific Bell.

"By the end of 1994, we plan to switch everything over to NT except the two Novell LANs in the legal department because they have applications tailored to their needs," said Warren Smith, a certified public accountant and certified information systems auditor in the auditing department.

All too clear

When the auditing department began looking into Windows NT early last year, OS/2's shortcomings became painfully obvious.

"The technology just wasn't mature enough for OS/2 at the time, both in terms of hardware and software," Smith said.

Prior to 1993, the 65 members of the auditing department, 13 of whom reside in remote locations, were using OS/2 2.0 on their desktop and laptop systems. But as the department added applications, many auditors ran out of disk space because of OS/2's 30M bytes or more of code. Users most affected were those with IBM's N51 notebooks that had only 80M bytes of disk storage.

Dearth of OS/2 support

Another problem was the lack of graphical applications that took full advantage of OS/2. For instance, the department was using the character-based version of WordPerfect Corp.'s WordPerfect for OS/2.

With neither disk compression products nor bundled LAN support for OS/2 on the horizon, Holcombe and Smith set off in early 1993 to evaluate competitive offerings.

Around the same time, Microsoft began beta-testing Windows NT. By the middle of 1993, Microsoft delivered the final beta ver-

Pacific Bell, *page 42*

ON SITE

Pacific Bell's Auditing Services Department
San Ramon, Calif.

Challenge: Establish a flexible architecture with a consistent user interface that allows auditors greater access to internal and external communications and gives users the ability to work with all aspects of the company's business.

Technology: Microsoft's Windows NT Advanced Server on servers and Windows 4.0 (Chicago) on client systems.

Results: Reduced from a few weeks to a few days the time it takes to process information for various auditing reports.

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SmartStream's foundation architecture is based on industry-standard technologies such as Microsoft Windows, Sybase SQL Server, PowerSoft PowerBuilder and TCP/IP. These technologies form an "enabling platform" that offers consistency, integration with standard mail and imaging tools, and greater flexibility in hardware and communications choices.

Customers see this open technology foundation as a key SmartStream strength. Phillips Cables Ltd. is one of Canada's largest manufacturers of wire and cable products with over a thousand employees and seven manufacturing facilities across Canada. Bob Culmer, Phillips' Director of Information Technology, recently chose to implement Financial Stream and SmartStream Decision Support for the company's accounting information needs, in part because of the products' technical architecture.

"The technologies D&B Software uses for SmartStream — Windows, Sybase SQL Server, PowerBuilder, TCP/IP — are also the technologies on which we've standardized for internal application development," says Culmer. "That means we'll have greater possibilities to integrate SmartStream with our own applications, and better internal support capabilities by working with a platform our developers already understand."

By starting with OAF, D&B Software was able to design essential features into SmartStream, such as a true distributed architecture. Both data and process can be allocated across multiple computing locations, so customers can easily distribute headquarters' accounting applications to other departments in their organizations. Each user's information and activity needs are handled by the individual client PC, which presents the user with specific task-oriented windows in response to the activities and requests of other users. Common services such as Scheduling, Security and Help are available to all SmartStream applications, easing support needs and increasing efficiency.

COMPLEMENTING TECHNOLOGY WITH SERVICES

D&B Software also developed a set of services and support offerings to complement its products and allow customers to gain maximum benefits.

The company's support solutions start with a world-class technical support center for front-line help, available seven days a week, 24 hours a day. D&B Software's support staff has the expertise to provide assistance not only with its own proprietary technology, but also with all the underlying third-party technologies in the SmartStream platform. In addition to standard phone support, customers can obtain extensive

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> “SMARTSTREAM WAS A GOOD CHOICE FOR OUR MOVE TO CLIENT/SERVER SINCE IT WAS DEVELOPED AS A NATIVE CLIENT/SERVER APPLICATION AND NOT JUST CONVERTED FROM THE MAINFRAME.”
>
> *Bob Culmer*
> *Director of*
> *Information Technology*
> *Phillips Cables Ltd.*

electronic support through SmartStream Assistant, a facility that allows remote diagnostics and instant distribution of software enhancements.

The company also offers services to ensure that customers realize the greatest return on their SmartStream investment. Through its own organization and business partnerships with Price Waterhouse, Andersen Consulting and other firms, the company offers a full range of consulting services, from system integration to the use of SmartStream as a platform for business process reengineering. D&B Software's education specialists provide comprehensive staff development and training programs for end users.

But perhaps the company's most unique services are its programs that fulfill a commitment to “sensible migration” to client/server. Through its research and experience, D&B Software knows the key issues customers face in the transition to client/server computing are managing time, expense and risks. The company's migration-assistance products and services provide ways to reduce problems with all three.

D&B Software's Customer Choice program provides lock-in maintenance pricing and preferred pricing of new technology for “on-maintenance” customers. SmartStream's modular design even provides a form of migration assistance, allowing customers to proceed to client/server at their own pace, gradually implementing new technologies that work side-by-side with existing mainframe applications.

A WORLD-CLASS PRODUCT SUITE

Starting from an integrated view of an entire enterprise's information and process needs, D&B Software's **SmartStream** product suite covers the most intensive data requirements of an organization:

- **Financial Stream** for all basic accounting functions from general ledger to reporting, plus management tools such as budgeting, cash management and cost accounting.
- **Manufacturing Stream** for full management of the manufacturing process, from product configuration to work scheduling.
- **Distribution Stream** to manage all major “in and out” functions, including order management, quotations, inventory, purchasing and shipping.
- **HR Stream** to handle employment information such as personnel, payroll and benefits.

All of these streams feed into one with **SmartStream Decision Support**, an information-integration platform that lets customers analyze internal and external information. Decision Support helps management throughout the company access and study information that drives the business, with the ultimate goal of better decision-making for greater productivity and valuable results.

For more information about D&B Software solutions, call 1-800-290-7374.

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Pacific Bell chooses Microsoft

CONTINUED FROM PAGE 39

sion of Windows NT 3.1. The product appeared to meet most of the important requirements on the auditing department's wish list, particularly those in the area of networking.

"One of the things that killed OS/2 in our evaluations was the lack of built-in LAN support, something we like about [both] NT and Windows for Workgroups," Smith said.

Smith and Holcombe agree that NT makes it much easier for users to install, configure and reconfigure networks, each of which has its own individual requirements. It also lets most Pacific Bell LAN administrators add users to networks faster and more efficiently, requiring fewer IS support people in the process.

"There are about 30 LAN administrators [companywide] now, but that number should shrink as we roll out NT," Holcombe said.

NT pros

With its built-in file- and print-sharing abilities, NT also gives the department the flexibility to use Windows for Workgroups as needed. The software has built-in peer-to-peer networking for communicating inside and outside the office.

A third benefit of Windows NT is that it gives the department a chance to move its applications to an all-graphical environment, cutting down on training and support. Three of the Windows-based applications the department uses include Microsoft's Word and Excel, along with Corel, Inc.'s Corel Draw.

While Smith and Holcombe have had only brief looks at the first full beta version of Chicago, they both said they believe the product will quickly become a companywide standard.

What they appreciate most about Chicago is not its flashier characteristics, such as its new interface or the prospect of 32-bit applications, but its built-in peer-to-peer networking and systems management features, such as the Registry.

The Registry acts as a built-in hook that can work hand-in-glove with Microsoft's Hermes, a software distribution product expected in the upcoming Windows NT 3.5, to better facilitate software distribution to the desktop.

"Chicago would appear to lessen the nightmares that keep LAN administrators up nights," Smith said, referring to the typical problems associated with tracking and maintaining PC software as well as reducing support costs.

> "The technology just wasn't mature enough for OS/2 at the time, both in terms of hardware and software."
>
> *Warren Smith, Pacific Bell's auditing department*

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Apple adds multimedia models

By Mark Halper
CUPERTINO, CALIF.

Apple Computer, Inc. may be staking its future on its PowerPC-based Power Macintosh line, but when it comes to multimedia, it is aiming the spotlight at its traditional 680x0-based boxes.

Apple recently added three Motorola, Inc. 68040-based systems that let users run a videocassette recorder or video camera through the Macintosh and cut and paste images from them into a print document. The systems also operate as television tuners, letting users watch broadcasts on all or part of a Macintosh screen.

Without add-in cards supporting the new video and tuner capabilities, prices for the three models start at $1,279 for a Quadra version targeted at the business market and $1,499 for a Performa version for the home market. The basic home version price includes a 14-in. monitor and a bevy of software not bundled into the basic Quadra. Prices for the LC version start at $1,349 and include a monitor.

Apple priced its Video System add-in card at $149 and its Video/TV System add-in card at $249. Another add-in card that allows the Apple to tie into a 640- by 480-pixel large-screen TV costs $299.

Apple said the new systems will be upgradable to PowerPC machines, although it declined to say when software will be available to enable PowerPC upgrades to take advantage of the Model 630's video and TV capabilities. It plans to disclose pricing and availability of a PowerPC upgrade card in the fall.

Analysts and users said they were not surprised Apple chose to implement the multimedia systems on its older processor technology rather than on the PowerPC-based Power Macintosh systems.

"The PowerPC realistically is their high-end system," said Tim Bajarin, an analyst at Creative Strategies, Inc. in San Jose, Calif. "What they really needed was a low-cost audiovisual system to go against the Packard Bells in the $1,300 range."

"They may be doing it for economical reasons," added Nick Kontis, unit manager at Southern California Edison Co. in Rosemead, Calif.

"You can't start introducing entry-level Power Macs at this point or you'll destroy all the low-end [680x0] sales," said Pieter Hartsook, editor of "The Hartsook Letter," an Alameda, Calif., newsletter.

The models will ship with SCSI and integrated drive electronics peripheral interfaces, 4M or 8M bytes of RAM and a 250M-byte hard drive.

New Apple

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Storage:	250M bytes
Modem:	2.4K bit/sec.
Monitor:	14-in.
Bundled software:	Eworld, ClarisWorks, Quicken 4, MacLink Plus Easy Open Translators and others
Price:	$1,499 to $1,549*

*Does not include video, video/TV or presentation add-in cards

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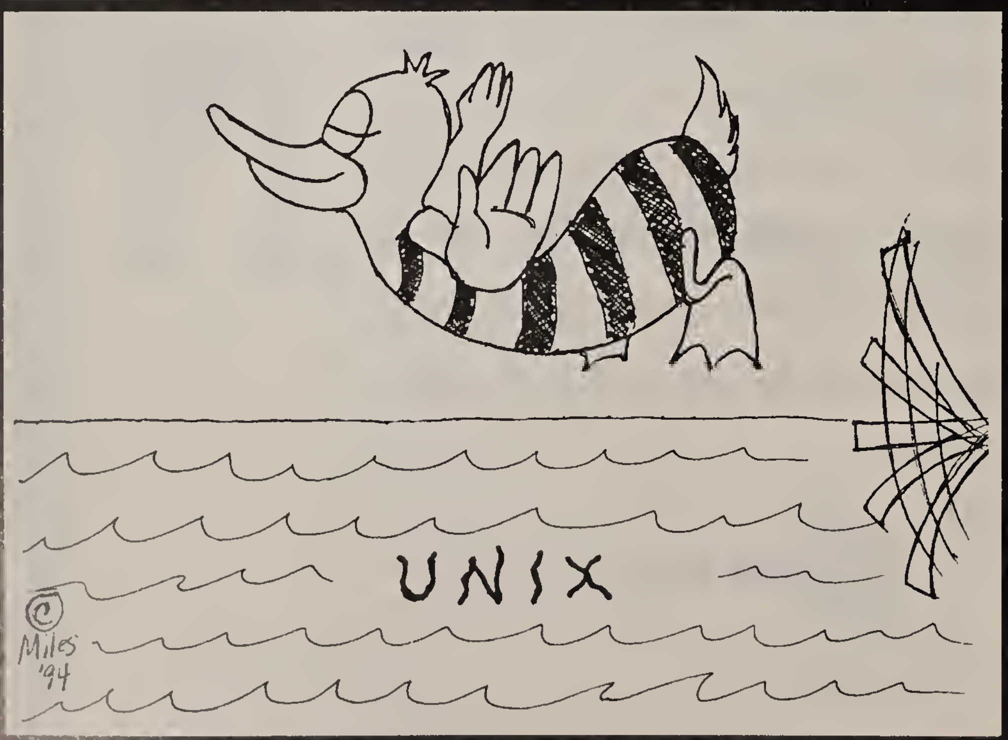

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Nonprofit unveils benchmark tools

By Jaikumar Vijayan

■ Less than eight months after it announced the availability of its SYSmark93 for Windows suite of benchmark products for desktop computers, Business Applications Performance Corp. (BAPCo) is preparing to release a new client/server version of its benchmark suite.

The Santa Clara, Calif.-based nonprofit organization is expected to announce its SYSmark94 for Servers sometime in the next two weeks, according to a spokesman for the corporation. Like its predecessor, BAPCo's new set of benchmark tools for the client/server environment will be based on standard business applications and will enable users to conduct hardware evaluations handling simulated work loads in a client/server environment.

The new benchmarks, which are being developed using Microsoft Corp.'s Open Database Connectivity protocol, will provide users with hardware benchmarks under a variety of operating systems including Microsoft's Windows NT Advanced Server, Novell, Inc.'s NetWare and possibly OS/2, according to BAPCo.

Whittling down

"BAPCo's benchmarks were generally useful for the task we had at hand," said Jim Rapier, a systems engineer at the Kentucky Department of Information Systems, referring to his efforts last year to evaluate and recommend systems for Kentucky's Department of Education. Rapier's department purchased SYSmark93 for Windows and ran the test on more than 60 different systems configurations in a formal weeding-out process that resulted in a shortlist of vendors that it recommended to the state's 176 school systems.

"This product was ordered for a specific purpose, and it was well suited for that," said Rapier, who used the benchmark to test standard word processing, database and spreadsheet applications on the scores of vendor platforms that were submitted for contract evaluation. Previously, the department had relied on hardware specifications such as processor speed and disk access speed to help make performance comparisons.

Perfect for big jobs

"Because of its generalized nature, generic benchmark suites like BAPCo's are ideally suited for aiding procurement decisions that involve mass procurement of new systems or a complete overhauling of existing ones," said Richard Zwetchkenbaum, a senior industry analyst at International Data Corp. in Framingham, Mass.

According to BAPCo, its benchmarks use standard desktop applications that are selected based on annual unit shipments of software. The benchmark suites include application software, scripts and the data necessary to run a simulated work load. For instance, the SYSmark93 for Windows benchmark suite provides an indication of a system's performance in major application areas such as word processing, database, spreadsheet, graphics, desktop presentation applications and even a copy of Windows 3.1 as an environment for executing the benchmark scripts.

The program can generate performance metrics as a composite of all the different applications or for a specific category of applications such as word processing or spreadsheets.

According to a user at a large oil company in Houston, while public domain benchmarks such as SYSmark93 for Windows provide useful but broad indicators of a PC's capabilities, they work best with internally developed benchmarks when evaluating systems for specific projects or applications.

New Products

Kelly Micro Systems, Inc. has announced the PowerPlant upgrade, a multichip module 486 upgrade for 286 PCs.

According to the Irvine, Calif., firm, the PowerPlant module snaps in place of the original 286 CPU, providing full 32-bit Windows compatibility.

All upgrades are equipped with a Texas Instruments, Inc. 486SLC microprocessor with 1K of internal cache, a 16K-cache controller and integrated 25-MHz clock generator and synchronizer and advanced interface logic.

Users can run Windows in Enhanced Mode on a 286 system without add-in boards or reinstalling software.

The PowerPlant upgrade costs $249.

▶ *Kelly Micro Systems*
(714) 859-3900

Product short

LaserByte Corp. has introduced a 3-in., 230M-byte magneto-optical disk drive, the LB3230. The drive features an average seek time of 28 msec and was designed for desktop publishing and graphics, multimedia, document imaging, computer-aided design and data archiving. Cost: $800. LaserByte, Sunnyvale, Calif. (408) 734-9200.

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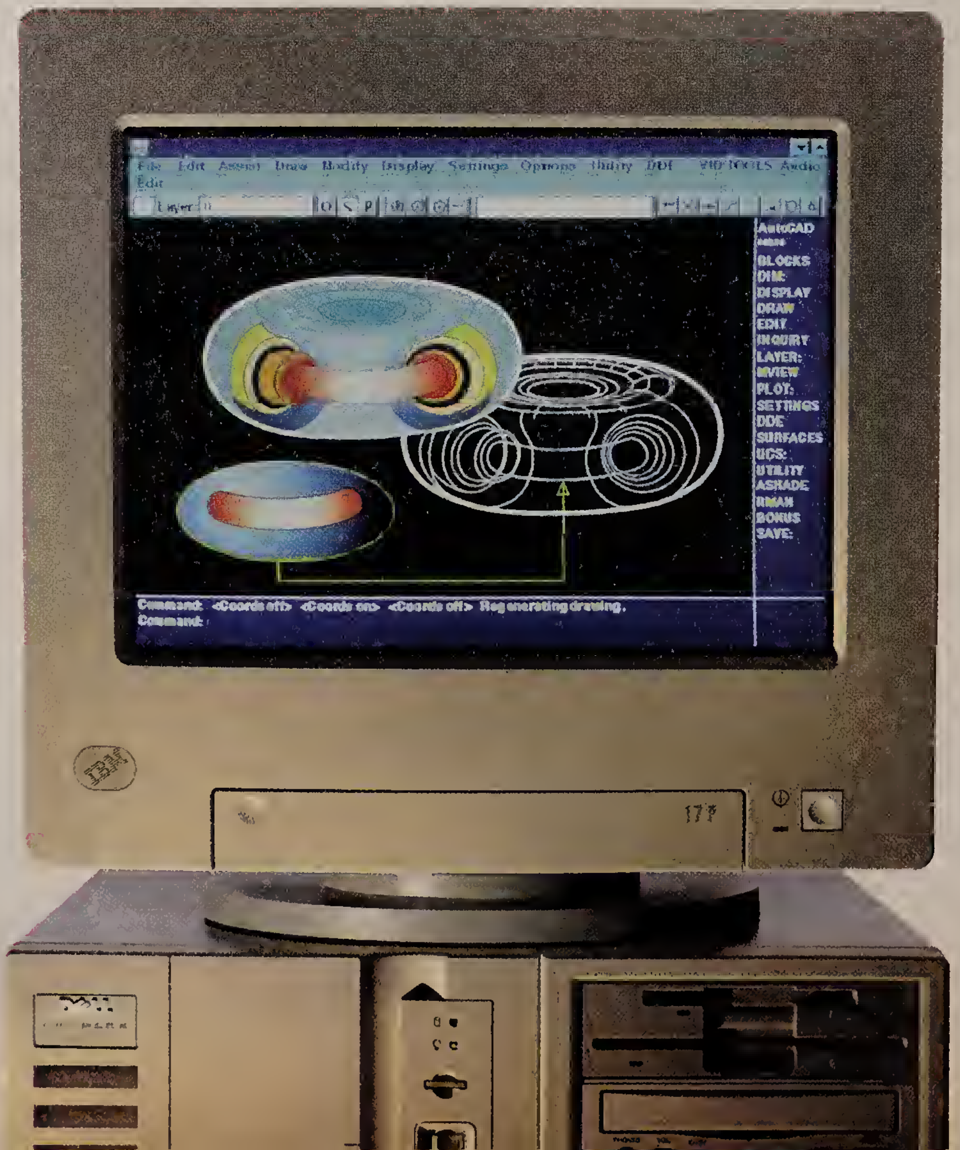
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Workgroup Computing

Groups team for document management standards, 50
New products, 52

Electronic forms technology shows maturity

By Lynda Radosevich

Information systems managers are beginning to seriously consider electronic forms-based workflow as a way to help reduce their firms' paper clutter and automate routine business processes.

DATABASE AND MESSAGING SUPPORT SPUR FORMS GROWTH

	Databases	Mail system	Programmability	Design tools	Overall strengths	Overall weaknesses
JetForm Corp.'s JetForm	Support for dBase, Paradox, ODBC	VIM, MAPI	No embedded scripting languages	Only adequate for most nondesigner applications	Excellent support for forms management, cross platforms	Not particularly flexible for design, no workflow tool set
Delrina's FormFlow	Support for dBase, Paradox, SQL Server, Notes, ODBC	VIM, MAPI, MHS, Apple's OCE, Simple Mail Transfer Protocol	Embedded forms description language links to Visual Basic and Windows calls	Excellent screen/paper form design interface	Push-button control of design and flow elements, good for novices and experts	Intelligent Forms Language is not as robust as Visual Basic or LotusScript
WordPerfect's InForms	ODBC support	VIM, MAPI, WordPerfect's GroupWise (formerly Office)	No embedded scripting language, uses macro sets	Missing some elements found in paper form development products	Good interface tools	Excellent workflow under GroupWise but poor support for other mail systems
Lotus' Lotus Forms	ODBC support	VIM, MAPI	LotusScript is embedded in the product	Excellent design tools via push buttons for the interface	Good workflow tool sets with predefined but flexible user rules	Cannot calculate, or total a column of values without programming
Microsoft's Electronic Forms Designer	ODBC support	MAPI only, and calls must be written in Visual Basic	Visual Basic	Interface/design tools are non-existent	Powerful control over objects and data movements	A programmer's tool

Source: Michael A. Bragen, independent consultant, Lexington, Mass.

Not to be confused with stand-alone, transaction-processing workflow systems such as those that help insurance companies route claims forms, the lower-end systems spring from desktop and LAN technologies. They are used to automate office procedures such as filing expense reports.

And while electronic forms packages have been on the market for years, recent changes — including links to the major messaging and database systems and new entries — are encouraging companies to move forward with electronic forms projects.

Check it out

"We've been looking at electronic forms for a couple of years but couldn't get a project off the ground," said Lori King, electronic forms project leader at KFC Corp. in Louisville, Ky.

Now that the technology has matured, KFC plans to launch electronic time card and expense report filing applications in September. KFC, a large user of Lotus Development Corp. software, will use Lotus Forms in conjunction with CC:Mail and Notes to build applications for 2,300 end users, King said.

Key to building the workflow applications are messaging and database links added to products from JetForm Corp., Delrina Corp., WordPerfect Corp. and others this year.

The messaging links are mainly provided through Microsoft Corp.'s Messaging Application Programming Interface (MAPI) or Lotus' Vendor Independent Messaging (VIM). MAPI and VIM support permits users to automatically route forms using their electronic-mail systems.

Database support is largely provided through Open Database Connectivity (ODBC) drivers. ODBC support permits users to populate the data fields of forms with information from corporate databases.

Some forms packages also include native support for certain databases. Native support is often more efficient than going through ODBC drivers, according to Michael Bragen, an independent software analyst in Lexington, Mass.

"ODBC drivers are like a middleman — a bridge that is not very efficient and can slow things down by 100%. In a large database that could cause major delays," Bragen said.

Full speed ahead

Cigna Systems, a division of Cigna Corp. in Philadelphia, is moving into full production next month with automated purchasing and procurement applications for 5,000 employees based on JetForm and Microsoft Mail. The company formerly used JetForm to eliminate the use of preprinted forms, but users still printed the forms before they used them, according to Mark Orthner, a senior technical service consultant.

"Before moving to workflow, we needed to have the E-mail and platform building blocks in place," Orthner said. For instance, the company had to make sure end users were running Windows and E-mail.

Of course, the work is not all finished. With the messaging system in place and messaging support built into the forms products, Orthner said the next thing he would like to see are better scripting and word processing capabilities such as fonts.

Novell/WordPerfect still face integrated support challenges

By Elisabeth Horwitt

Users better get ready to open their wallets if they want to receive an adequate level of direct support for the upcoming generation of networked applications from Novell, Inc./WordPerfect Corp.

The companies are still very much in the discussion phase of creating an integrated support plan, spokesmen said in an interview last week. The plan is slated to be unveiled at the Networld/Interop '94 show in September. However, the spokesmen indicated the firms will work to extend their respective programs for offering high-end, direct support on a pay-as-you-go basis.

"The application side is getting more technical all the time, so people need service and assistance more than ever," a WordPerfect spokesman said. However, unlike in the past when support was factored into the cost of a package, WordPerfect is moving to where "you choose your level of service" and pay accordingly, he said.

Get with the program

WordPerfect now offers a Classic support package, with toll-free support for six months, plus a Premium support family of fee-based programs.

Novell recently announced its Corporate Accounts Program (CAP), which provides a range of direct support options to major customers for a price. CAP is "one of the areas where we see synergy" between the two companies' product and support offerings, said Jan Neuman, Novell's senior vice president of service and support.

While refusing to give details, he added that one of CAP's strengths is an account manager who saves the customer from "worrying about [a technical support person] saying, 'I'm the network guy,' or 'I'm just the application guy.' "

"I think you'll see [WordPerfect/Novell] slice off the high end of support from the basic license, particularly for corporate accounts, and provide it on a fee basis," said David Cearley, a vice president at Meta Group, Inc., a Westport, Conn., consultancy.

This is an increasingly common industry phenomenon "as corporations press for lower licensing costs, and competition from suite vendors gets cutthroat," Cearley added. It is also potentially positive because it "allows corporate accounts to adjust their support expenditures to their actual needs."

Dissenting opinion

Not all users agreed with this assessment. "I don't like this subscription direction that support is going," said H. Reid Hoadley, director of information systems at St. Joseph's Hospital in Kirkwood, Mo. He conceded that "the user support issue becomes more complex" as the industry goes from individual applications to networked applications and suites. But the cost of support should

Integrated support, *page 51*

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Desktop Management Interface (DMI)[3]	X		

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Groups team for cross-platform document standards

By Ellis Booker

Efforts by three document standards groups appear to be on track, and their work could be reflected in compliant products early next year. Even better, the three groups seem intent on coordinating their efforts without rancor, as was shown by their separate but coordinated meetings in Boston this month.

Document
Management

"The tone of the whole week was very much of cooperation," said Ira Scharfglass, general manager of document management products at Xsoft, a division of Xerox Corp. "The idea is to grow the industry. We knew any hint of API wars would do the opposite."

Xsoft and Novell, Inc. are working on a Document Enabled Networking (DEN) initiative. When completed in the first or second quarter of next year, DEN will specify a standard for document management services and applications—initially for Novell 4.x environments. The other two document groups conducting meetings were the Shamrock Document Management Coalition and the Open Document Management API (see story at right).

Scharfglass said the three groups deliberately met during the same week in the same city so their overlapping representatives could attend one another's meetings. More than half the attendees were common at all three events, and a similar gathering is being talked about for September, he said.

One tangible outcome is that the Shamrock and DEN initiatives, both of which are working on standards for linking diverse document management servers and services, have created a joint working group.

"They'll be studying both specs, identifying commonality and working to make the two compatible," Scharfglass said.

Learning to work together

This spirit of cooperation will be welcomed by users, who have come to realize that their own mass of documents and files are a critical business resource that must be made available across the enterprise.

"I was working with a company on a [request for proposals], and the client added a requirement that his vendor's products must be ELS-aware or on the road to ELS," said James Popkin, program director at Gartner Group, Inc. in Boston.

ELS, or the Enterprise Library Service, is the first application programming interface (API) out of the Shamrock Document Management Coalition. In June, the group issued the draft ELS specification, which dictates how document repositories interface to external services.

The final version of ELS will be out in three to six months. "The first ELS applications will be available in early 1995," Popkin predicted. He also suggested that document-enabled Novell NetWare, which he expects will be available next June, will implement both DEN and the Shamrock API.

But meetings among the three groups are "only the first step, and there is still a long way to go to resolve the overlaps," said Frank Gilbane, president of Publishing Technology Management, Inc. in Cambridge, Mass.

Cooperative efforts

The three groups at work on cross-platform document standards are the following:

- **Open Document Management API**
  Mission: A client-level standard for specifying how client applications interact with different document management systems.
- **Shamrock Document Management Coalition**
  Mission: Platform-independent APIs that will permit different document management systems to interoperate. In June, Shamrock released its first API, Enterprise Library Service.
- **Document Enabled Networking**
  Mission: To deliver standard services for document management systems on LANs, first for systems operating in NetWare 4.x environments. Like Shamrock, the standard will also allow applications to write to a single API to access information in a different vendor's repositories.

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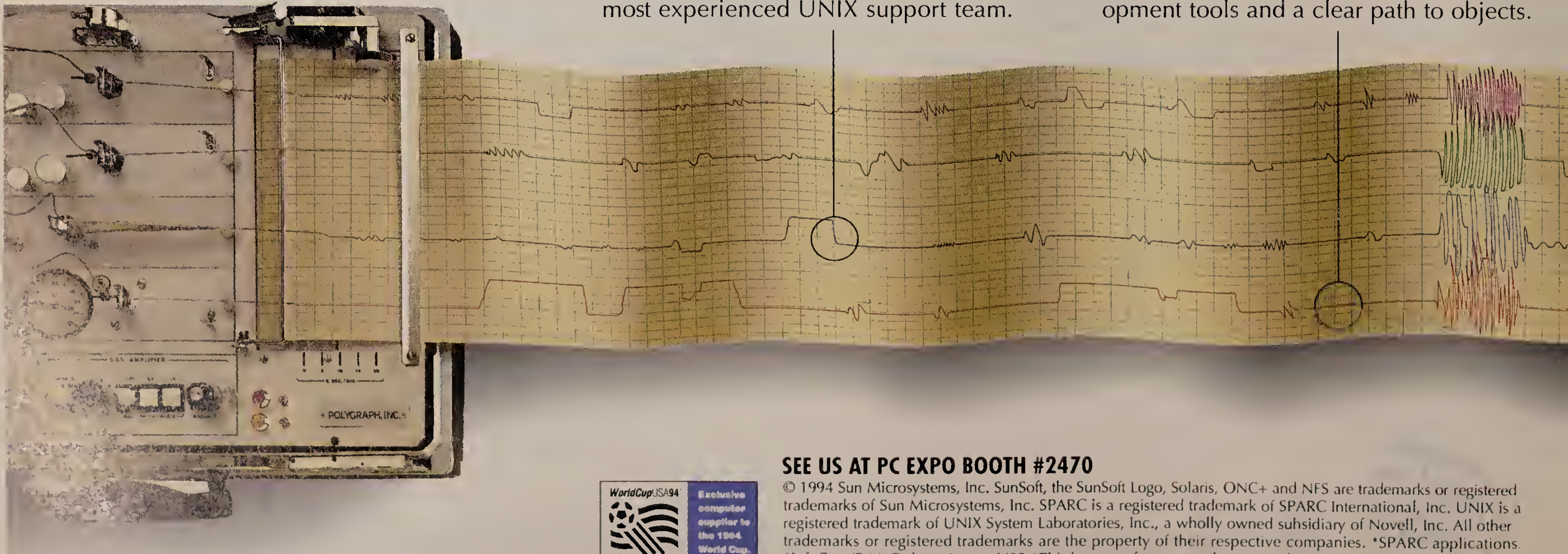

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Market newcomer to ship first superserver

By Jaikumar Vijayan

The superserver arena has a new entrant: Sentinel Systems, Inc. The Horsham, Pa.-based subsidiary of Helionetics, Inc. will start shipping its first Sentry-E line of super-server-class systems this month.

Sentinel's EISA-based Sentry-E is being manufactured under contract by IBM at IBM facilities in Charlotte, N.C. The system has a Pentium-upgradable base configuration. The dual-processor system features 66-MHz Intel Corp. I486-based processors, with 16M bytes of bus-resident RAM, expandable to 512M bytes. Priced at roughly $50,000, the system also has a 400M-byte SCSI storage.

System features

According to Richard Sergo, chief executive at Sentinel, the system was designed with multiple buses, storage devices, processors and other functional devices to give it a high degree of fault tolerance. The system also features a proprietary fault isolation and recovery scheme that warns users of failed components.

The Sentry-E's price and performance range puts it on the same turf as products from Tricord, Inc. and NetFrame Systems, Inc., according to Andrew Seybold, editor in chief of "Outlook on Professional Computing."

Possible niche

Seybold predicted that the Sentry-E could make an impression in the banking and communication fields because of its price and fault-tolerant capabilities.

"It is one of the most fault-tolerant systems on an industry standard platform that I have seen," Seybold said. He said that while the Sentry-E's I486-based processing capabilities put it in the range of lower priced servers, its fault-tolerant capabilities are comparable to substantially higher priced systems.

> "It is one of the most fault-tolerant systems on an industry-standard platform that I have seen."
>
> – Andrew Seybold
> Editor in chief
> "Outlook on Professional Computing"

Briefs

OpenVision packages apps

OpenVision Technologies in Pleasanton, Calif., announced four new systems management packages. The four applications address charge-back accounting, access authorization, batch-job scheduling on multiple machines and support for hierarchical storage management (HSM) that dovetails with mainframe HSM systems. The OpenVision modules run on Sun Microsystems, Inc.'s SunOS and Solaris 2.x, Hewlett-Packard Co.'s HP/UX and IBM's AIX. Software agents are priced at several hundred dollars. The price of a system administrator console ranges up to $10,000. The HSM product can cost up to $20,000.

Octel adds voice to Exchange

Octel Communications, a voice processing company, announced support for Microsoft Corp.'s Exchange. The company said it will enable voice mail to be accessed on a PC using Exchange in the same way that electronic mail is accessed.

Integrated support challenges

CONTINUED FROM PAGE 47

still be bundled into the price of the license, Hoadley said. Otherwise, "it's a whole new cost we normally don't factor in" to the IS budget.

Novell needs to take a page out of WordPerfect's book, particularly when it comes to setting up a support infrastructure, if it is to "fix the black eye it has in many parts of the market for its support," Cearley said.

WordPerfect in particular is worth copying for its infrastructure, "for logging and tracking calls and getting the right information to the right people in a timely fashion," he said.

WordPerfect/Novell spokesmen also sought to reassure nervous customers that their joint support offerings will include the full range of programs now available from both companies.

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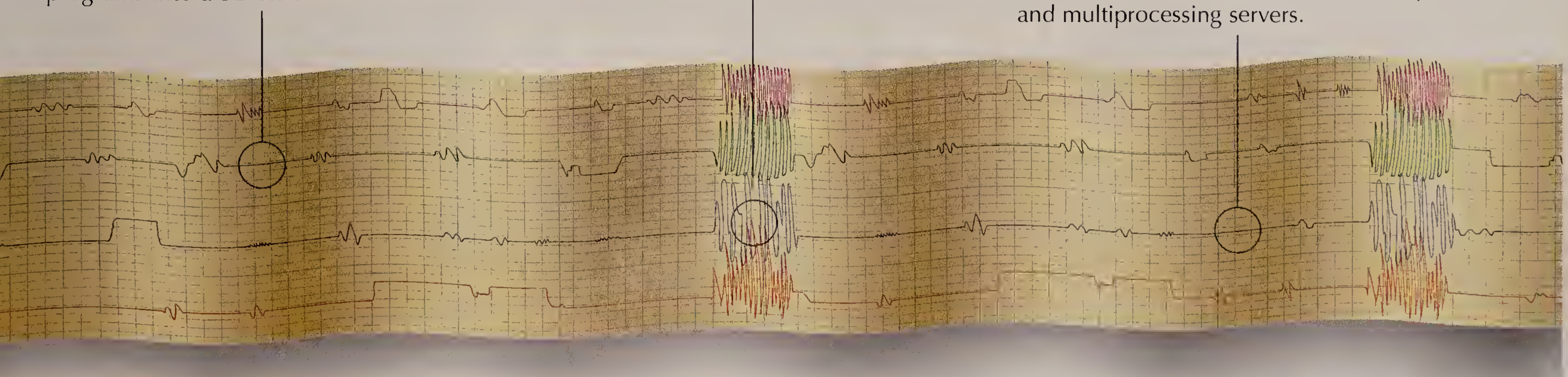

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New Products

Concepts Dynamic, Inc. has announced the CDI Control Series 5.0, client/server accounting software.

According to the Schaumburg, Ill., company, CDI Control Series 5.0 handles multiple languages and currencies, tracks changes to system tables and provides improved archiving and purging of information.

The CDI Financial Control System includes financial modules for general ledger, accounts receivable credit management, accounts payable and fixed assets.

The CDI Project Control System includes modules for project management, job orders, labor, employee expenses, purchasing and customer invoicing.

The CDI Control Series runs on any Unix-based computer with Informix Software, Inc.'s Informix-OnLine or Informix-SE database engines. The desktop client runs as a native application under Windows.

Prices range from $7,500 to $60,000 per module.

▶ *Concepts Dynamic*
(708) 397-4400

IXI Corp. has announced that IXI Panaroma, its Motif work space manager software, supports all major Unix platforms.

According to the Santa Cruz, Calif., company, IXI Panorama lets users of standard Unix environments spread windows and icons limitlessly beyond their screens and access them with a point and click or smooth pan across the entire work space.

The product lets users have more applications available and running on their desktops and lets them personalize their work space with a graphical configuration tool.

A sticky window facility lets users glue specific critical-data windows to the screen so data will move with the user.

IXI Panorama costs $149 for a single-user license on any platform.

▶ *IXI*
(408) 427-7700

MidCore Software, Inc. has announced MidPoint for IEF, application middleware that provides access to Texas Instruments, Inc.'s Information Engineering Facility (IEF) applications.

According to the Waterbury, Conn., company, MidPoint for IEF lets end-user applications seamlessly access IEF-controlled data and lets IEF applications become open to graphical user interface tools, report writers and analytical tools.

MidPoint for IEF converts and reformats data so that front-end application software receives data in an expected format and maintains the security and integrity of the IEF data.

Prices start at $13,725.

▶ *MidCore Software*
(203) 759-0906

Conner Peripherals, Inc. has introduced the CR6-RAID 4G-byte configuration for PC LANs.

According to the San Jose, Calif., company, the CR6-RAID is an external, six-bay redundant arrays of inexpensive disks (RAID) system configured with four 1G-byte Conner disk drives that allow a low-capacity entry point for RAID.

The product provides data transfer rates over a Fast SCSI-2 interface of 20M byte/sec. with an average seek time of 10 msec.

The CR6-RAID includes an option for a hot on-line spare drive, redundant power supplies and dual cooling fans. An audible alarm sounds to indicate failure in any of the components.

Prices start at $8,375, and the product comes bundled with Conner Array Management System software.

▶ *Conner Peripherals*
(408) 456-4500

PaperClip Imaging Software, Inc. has announced PaperClip for Windows Version 3.0, PC/LAN integrated document management software.

According to the Hackensack, N.J., company, PaperClip for Windows Version 3.0 organizes information in on-line file folders that may contain scanned or faxed image documents as well as software files.

Users can store documents and software files to magnetic or optical media, and multiple users on a network can access these images simultaneously.

PaperClip for Windows Version 3.0 costs $595 for the PC version and $995 per seat for the network version.

▶ *PaperClip Imaging Software*
(201) 487-3503

Watermark Software, Inc. has announced that its Professional Edition and Image Server products will support Microsoft Corp.'s Exchange platform.

According to the Burlington, Mass., firm, the products provide enterprise networks with mainframe-class imaging performance.

Professional Edition lets users incorporate faxed or scanned paper documents into client/server environments. Image Server is Windows NT-based server software that provides scalable image management.

Prices for Professional Edition range from $295 to $19,995, and prices for Image Server range from $2,995 to $9,995.

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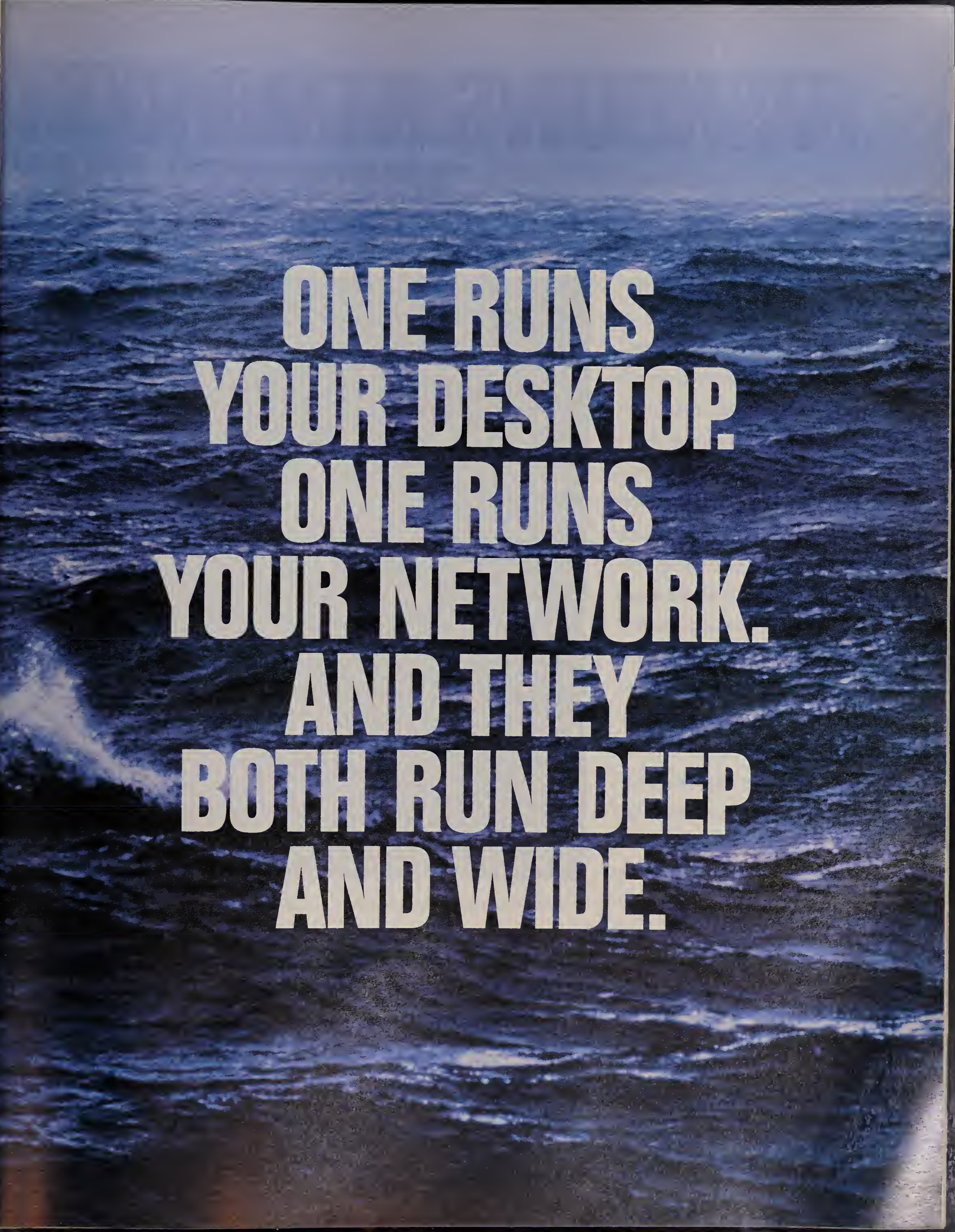
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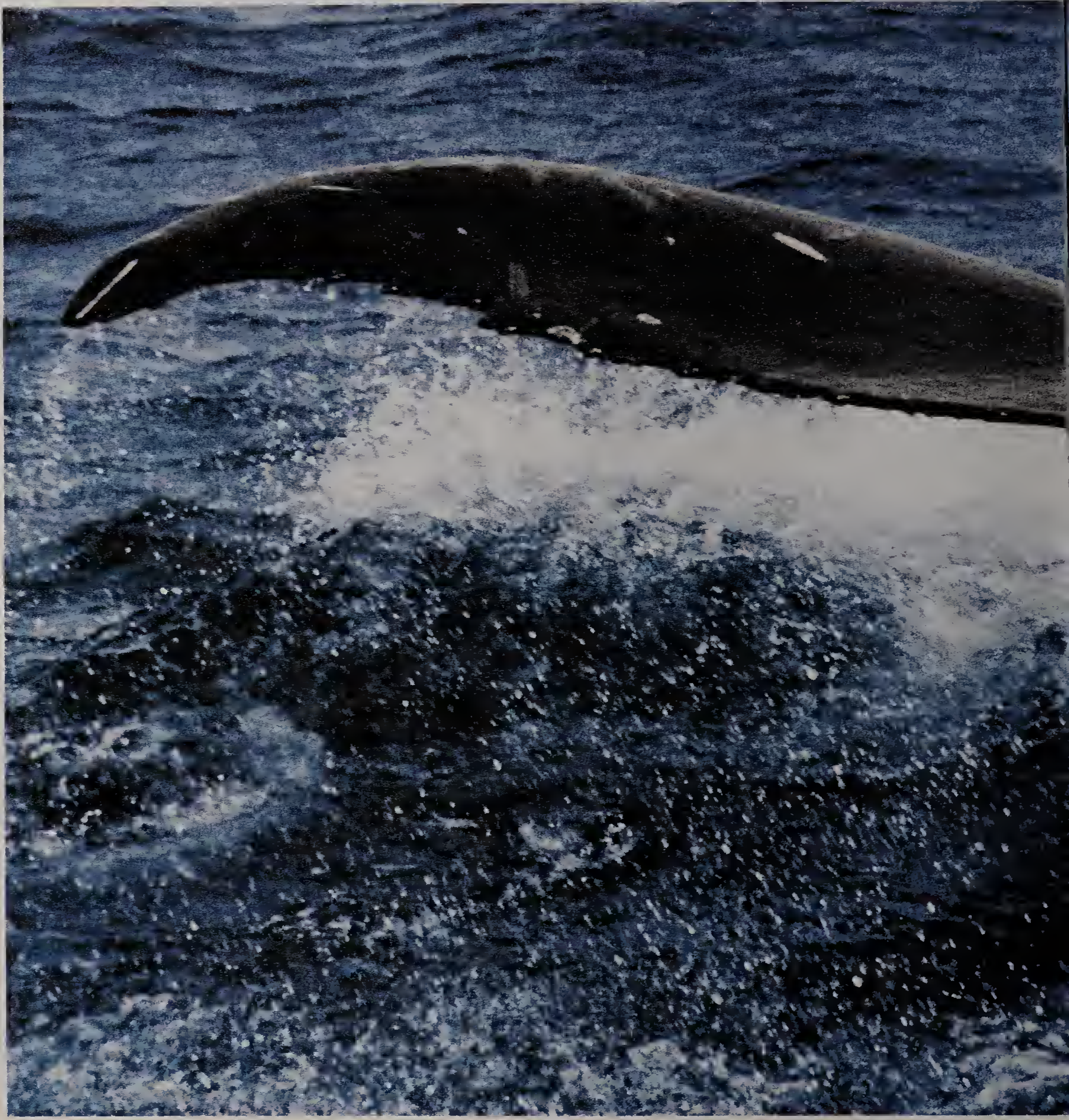

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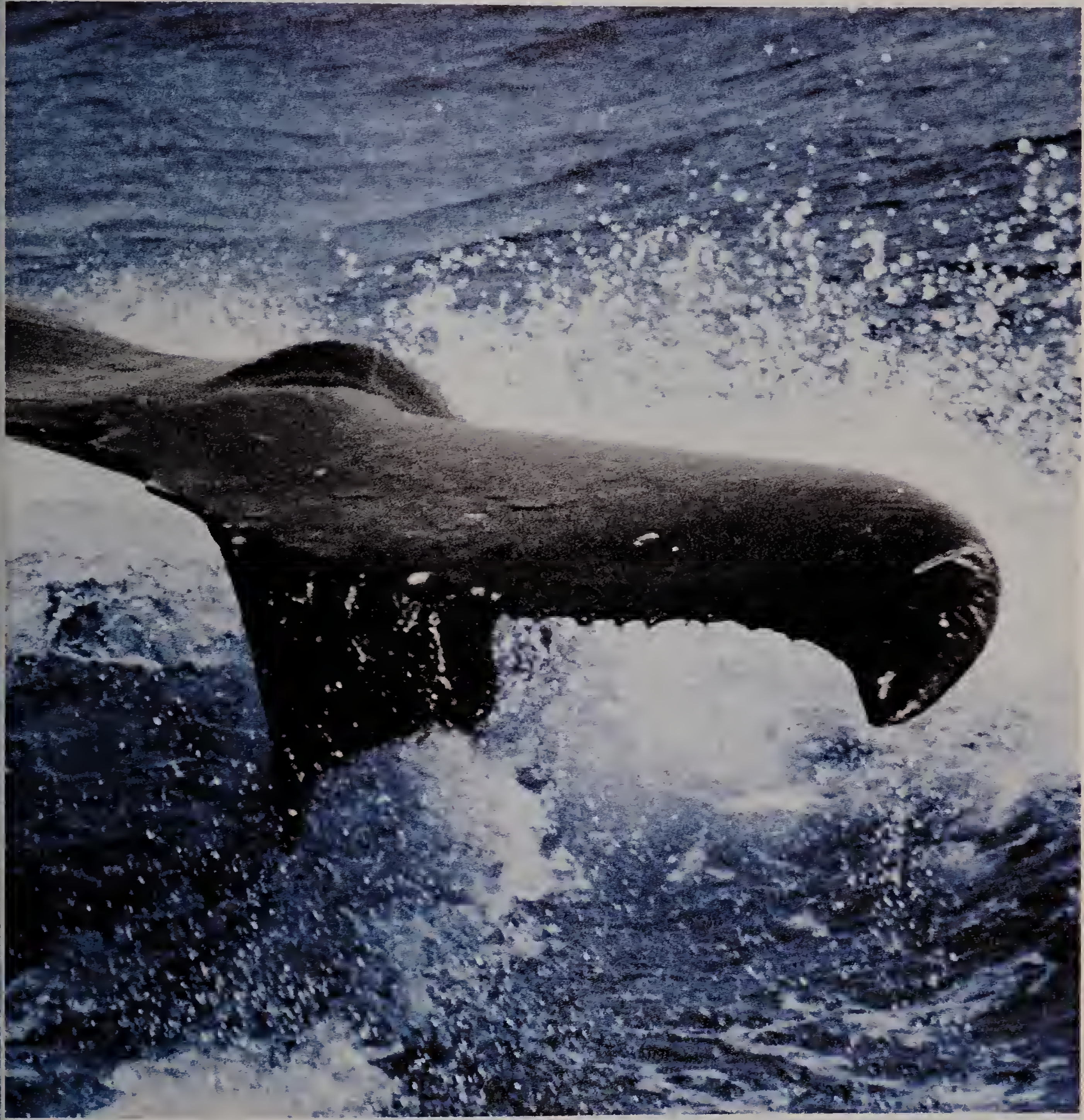

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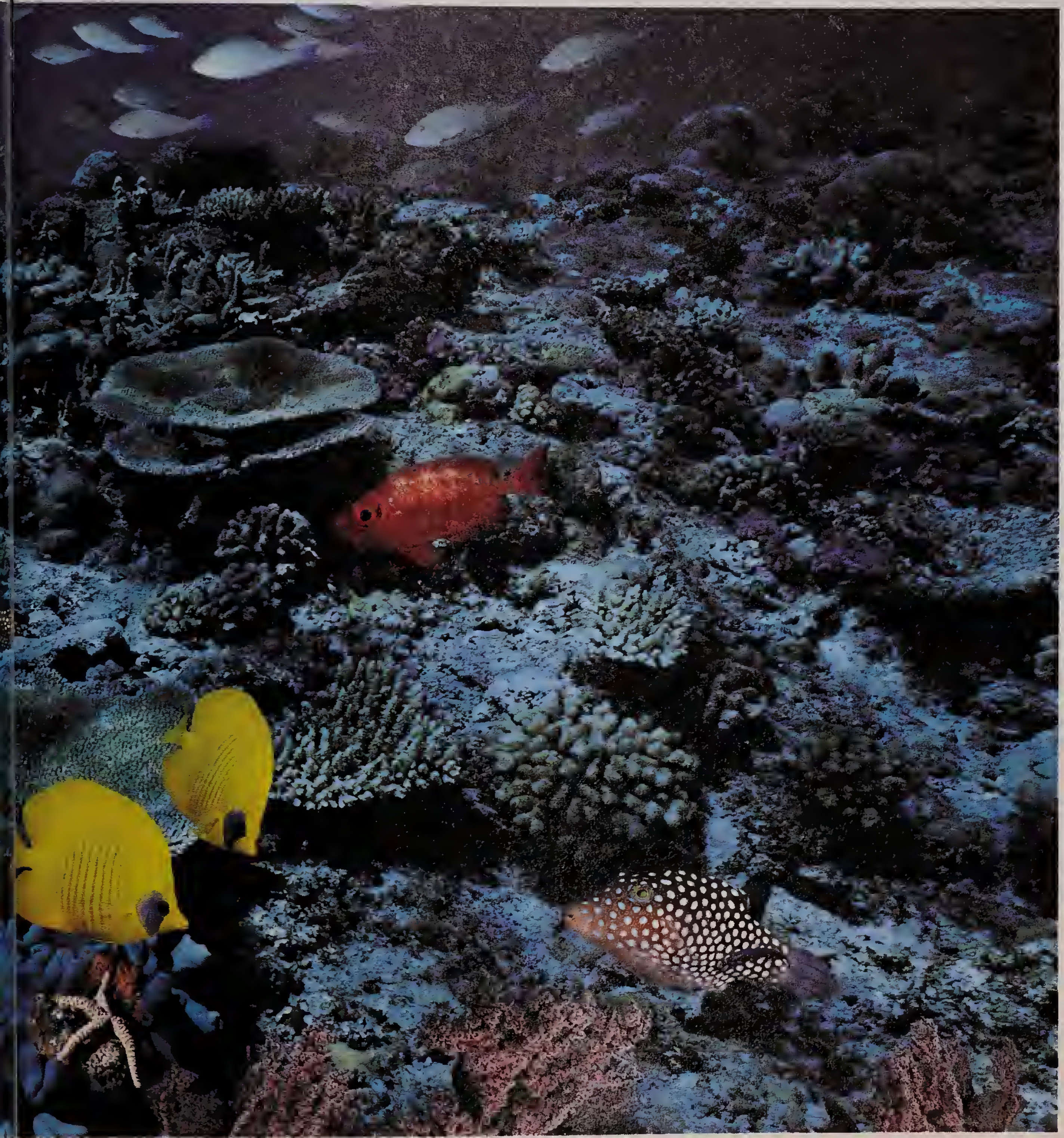

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Token Ring switching gathers steam

By Stephen P. Klett Jr.

■ IBM, Chipcom Corp. and Centillion Networks, Inc. each announced switching products last week aimed at providing relief for bandwidth-strapped Token Ring environments.

Until now, Token Ring's higher performance has staved off the bandwidth problems that have plagued Ethernet for the last couple of years. Token Ring provides a maximum bandwidth of 16M bit/sec. — 6M bit/sec. more than Ethernet. In addition, Ethernet begins to hit congestion problems at 58% utilization, while Token Ring becomes bogged down at 90%, according to Thomas Nolle, president of CIMI Corp. in Vorhees, N.J.

Pressure cooker

However, Token Ring sites are beginning to feel a bandwidth pinch and are looking for products to help ease the pressure, according to users and analysts.

"We've got a 100% bridged environment and are starting to run into bandwidth problems, which we expect switching will eliminate," said Steven Toce, an engineering consultant at The Travelers Corp., a Token Ring site in Hartford, Conn.

IBM and Chipcom cast their first bids at winning this emerging market last week in the form of switching modules for their respective hub platforms. However, Centillion, a start-up in Mountain View, Calif., stole the limelight with the unveiling of its Speed Switch 100.

The Speed Switch 100 is a Token Ring switch aimed at workgroup and backbone connectivity applications. It has an aggregate throughput capacity of more than 10G bit/sec. It can also house up to six switching modules — providing up to 24 ports of connectivity — at prices starting at $10,000 [CW, July 18].

However, more important to users than the switch's speeds and feeds is Centillion's strategy for migrating Token Ring users to Asynchronous Transfer Mode (ATM). This consists of the following three steps:

- **Phase one:** Replace a bridged environment with Token Ring switching for applications such as server consolidation and collapsed backbone.
- **Phase two:** 155M bit/sec. full-duplex ATM backbone connectivity.
- **Phase three:** 155M bit/sec. ATM connections for servers/power users; 25M bit/sec. ATM connections for new desktops.

Phase one will begin when Speed Switch ships in October. Phases two and three will be delivered in the first quarter of next year. Centillion also plans to offer an Ethernet switching module at the same time.

In sync with strategy

Users said this strategy and product delivery schedule is in line with their needs.

"ATM is where we ultimately want to go, but we need basic switching capabilities first, and Centillion's strategy makes a lot of sense," said Graham Morrison, project director for network design and engineering at Token Ring site Blue Cross/Blue Shield in North Haven, Conn., which plans to beta-test the Speed Switch.

Travelers also plans to test the switch.

A perceived lack of support from IBM is a major motivator behind Blue Cross' consideration of technology from a start-up. "IBM's support for existing Token Ring users like us is in question," Morrison said. "If [Speed Switch] works as advertised, I'll have no qualms about using it."

IBM's Token Ring-to-ATM strategy requires users to upgrade from its 8250 hub to its 8260 intelligent hub, which supports Token Ring switching capabilities. IBM will offer an ATM interface during the first half of next year, said Laura Knapp, senior networking systems adviser at IBM in Research Triangle Park, N.C.

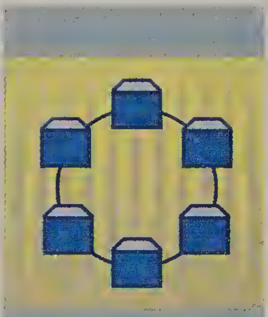
Last week, IBM announced an 18-port active-media module and a 20-port passive-media module for the 8260, which cost $5,140 and $3,145, respectively. Both modules will be available in October. Chipcom, IBM's Token Ring development partner, announced similar modules for its Oncore hub. They will ship in September for $4,895 and $2,995, respectively.

The IBM modules provide per-port switching to any one of 10 Token Ring segments supported by the 8260. This allows network managers to move individual users via a central management console to a separate ring to reduce congestion.

Speed shortage

Users said they were pleased with the modules because they show that IBM and Chipcom remain committed to supporting Token Ring. However, they said Speed Switch, which provides nonblocking switching to all local ports, should provide higher performance.

"We don't think the switching capabilities for the 8260 will eliminate our bandwidth concerns because it does not provide a dedicated connection between two devices," Morrison said.



Who's on first?

Madge Networks, Inc. in San Jose, Calif., announced in April a Token Ring-to-ATM strategy similar to Centillion's. However, field trials of its Token Ring switch are not expected to begin until the first quarter of next year.

IBM unveils APPC software suite

By Elisabeth Horwitt
BOSTON

IBM recently announced a suite of prewritten software modules for its Advanced Programming-to-Programming Communications (APPC) protocol as part of its strategy for easing the burden of programming.

IBM's APPC is a way to enable applications to talk to one another across a broad range of IBM and non-IBM systems through an SNA network. APPC has been finding a secure niche at IBM sites that are trying to allow desktop machines — primarily OS/2 clients — to access a combination of server- and mainframe-based services such as database and backup.

Provident Life and Accident Insurance Co. in Chattanooga, Tenn., for example, has an extensive APPC implementation across some 35 Token Ring-bridged LANs and some 1,500 OS/2 workstations.

The firm chose APPC partly for its performance. An early implementation of IBM's TCP/IP file transfer protocol (FTP) delivered 700K byte/min. between an OS/2 and a mainframe, said Gerry Williamson, senior systems programmer at Provident. In contrast, APPC delivered 4M to 6M bytes/min., he said.

On the other hand, it took a couple of programmers about 30 days to develop the APPC-based FTP application, Williamson said.

More than 30% of 774 mainframe shops surveyed in November 1993 said they used APPC. Another 28% said they plan to do so by 1996, according to Xephon Ltd.

APPC's problems

Indeed, the comparative complexity of APPC has made application development difficult and lengthy, users and analysts said. Another major drawback has been its lack of service modules such as file-transfer and terminal emulation.

In addition, APPC has had a disadvantage against remote procedure call, which is much simpler to work with, if less functional, according to Anura Guruge, an independent SNA consultant in Ipswich, N.H.

A sample "basic hello application" demonstrated by IBM at a recent conference here took "pages and pages of C code," whereas the same application would take less than a page using remote procedure call, Guruge said. "LU6.2 is very powerful, but it has never been easy to work with."

Possible solutions

As a solution, IBM came up with its Common Programming Interface for Communications (CPIC). "But even CPIC is not easy to use," Guruge added.

The new APPC directory and file-transfer modules are "nice, small extensions that will make the life of people delivering APPC applications easier," Guruge said.

Configuration is another area of APPC that IBM is addressing with its APPC Market Enablement program, the company said. IBM and third-party developers are working together to improve and simplify the configuration of APPC and to create a common configuration language for the protocol.

This will be useful to companies such as Provident. "We implemented IBM's Advanced Peer-to-Peer Networking — not as an internetworking protocol but to reduce the administration for our APPC applications," Williamson said.

APPC features

IBM announced the APPC Application Suite earlier this month. It includes the following:

▶ APPC file transfer protocol.
▶ A3270, which enables 3270 data streams to run over APPC.
▶ APPC Name Server, a simple directory that allows users to assign, query and delete nicknames for SNA logical unit names.
▶ APPC Message Program.
▶ APPC Remote Command Execution.

The suite will initially run on Communications Manager/2, IBM's OS/2 networking software; AIX SNA Server/6000, which connects RISC/6000 workstations to SNA and Advanced Peer-to-Peer Networks; and VTAM for MVS and VM, IBM said. Support for third-party platforms is in the works.

The suite is available via CompuServe.

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Commentary

Ted Prince

Beware of the Internet

I guess it's now de rigeur to have on your business card an Internet address, the computernik's version of a Rolex. My advice is to leave it at that. Show the world you know what it is, but don't use it if you know what's good for you.

My feeling is that we're on the verge of the Internet becoming the on-line killing field.

Recall the Internet's origins — National Science Foundation, academics, debates and the like. It's the cyberspace equivalent of an Oxford debating club, with gentleman users, Queen's English and the rules of debate. A nice place to chat with other intellectuals, however quirky and unworldly, who are interested in the good of mankind.

Basically, it's 20th century technology with 19th century manners — an oasis of civilization totally removed from the real world.

Does that sound like the Internet of tomorrow to you? Pretty unlikely, I'd say. The Internet is going commercial, being invaded by the great unwashed, being extended to many people who will probably not play by Queensberry rules. Pretty soon some people are going to extend their nasty competitive squabbles and habits to this realm, too. Forget the oasis, the Internet is set to become a crucible in which much of the business and commercial world's dirty laundry will be aired.

What's it all about?

So what does that mean to you? So you link your computers to the Internet with all manner of fashionable goodies such as direct links, file transfer protocol and many others. At the very least it could mean unwanted intrusions into your airspace. But there's more.

Unless you're very careful, it means you could be open to electronic snooping, theft of files and information, maybe unknown parties disseminating disinformation and infiltrating it into your own files. Physically hurting your competitors, which before was difficult to do, now in principle becomes very easy. Do you think that today's electronic citizens are still going to follow Queensberry rules?

But there's still more. Expect the proliferation of Internet use to be accompanied by a proliferation of viruses that will be increasingly sophisticated — and nasty. About 2 million computers are on the Internet, and that number is increasing at a huge rate. Now there's a nice market for potential infection.

Protect yourself

Internet users are still engaging in the electronic equivalent of unprotected sex. Expect to see some nasty diseases become rampant on it. So far, there are few watchdogs for the Internet, mainly part-time and voluntary and totally inadequate for the task ahead.

The fact is we're now in the honeymoon period of the 'net. But with increasing business use and democratization of the network, it's going to change its character, in many ways for the worse. Queensberry rules will change to whatever goes. The social and ethical character of the Internet is about to undergo momentous change. Users will have to take strong precautions or use it only for the most trivial purposes.

So leave your Internet address on your business card, but remember to back it up with another address of a commercial service. The latter may not be so sexy but will likely be better policed and regulated and a whole lot safer. And you may end up not having to regret as much.

Prince is president of Perth Ventures, Inc., a technology publishing and mergers and acquisitions firm in Hawley, Pa. He can be reached by CompuServe at 74073,1236.

Pirates lurk on the info highway

Increased concerns cause publishers to pull material off the Internet

By Mitch Betts

WASHINGTON

The recent decision by a newspaper syndicate to yank humorist Dave Barry's column off the Internet has two implications. One is that the Internet will suffer from a lack of stories about exploding cows (a Barry favorite).

The action — taken because unauthorized duplication of the copyrighted newspaper column had gotten out of control — also demonstrates that publishers are deeply concerned about piracy of copyrighted material on public networks.

"In an age of high-speed, high-capacity digital communications, demand for copyrighted works will explode," said Joe Waz, co-director of the Creative Incentive Coalition in Washington. "But the opportunities for unauthorized use of copyrighted works will also explode. If that abuse is not deterred, there will ultimately be less information on the information superhighway."

The Clinton administration recently released a draft report that calls for fine-tuning the federal copyright laws to address this problem before the National Information Infrastructure is built. The report calls for an amendment to explicitly state that electronic copying and distribution of copyrighted works is illegal.

The copyright law covers the copying and distribution of physical copies of books, magazines and software disks, for example, but is less clear on network piracy, said Bruce Lehman, commissioner of the U.S. Patent and Trademark Office and head of a task force on intellectual property issues.

Lehman said there will not be network "copyright police," and he acknowledged that small-scale "leakage" will always exist when people make copies of on-line articles to share with friends and family.

But Lehman said he is more concerned with large-scale "hemorrhages," where commercial enterprises arise to steal copyrighted information for resale. That could draw civil lawsuits from the infringed parties, he said.

In between there is the gray area of corporate users who download articles from on-line information services for use in company newsletters and reports. Publishers and user groups will need to develop voluntary guidelines on "fair use" of on-line materials, much like the guidelines now in place for photocopying articles, Lehman said.

One on-line service is already offering a service that allows honest folks to pay royalties for the reuse of on-line articles.

Dialog Information Services, Inc. in Palo Alto, Calif., has established a compliance service that allows on-line users to pay royalties based on the number of electronic copies they make and remits the fees to the copyright holder.

Another option is for publishers to encrypt their works for protection. "Unless you encrypt it, you'll have a hard time enforcing your rights," Lehman said.

He also called for an amendment that would outlaw devices intended to defeat encryption schemes for purposes of electronic piracy.

Software, too

The problem of on-line piracy also concerns the software industry because of the ease of distributing source code over global networks. Last year, the software industry lost more than $12.8 billion due to piracy — $2.2 billion in the U.S. alone, according to the Business Software Alliance in Washington.

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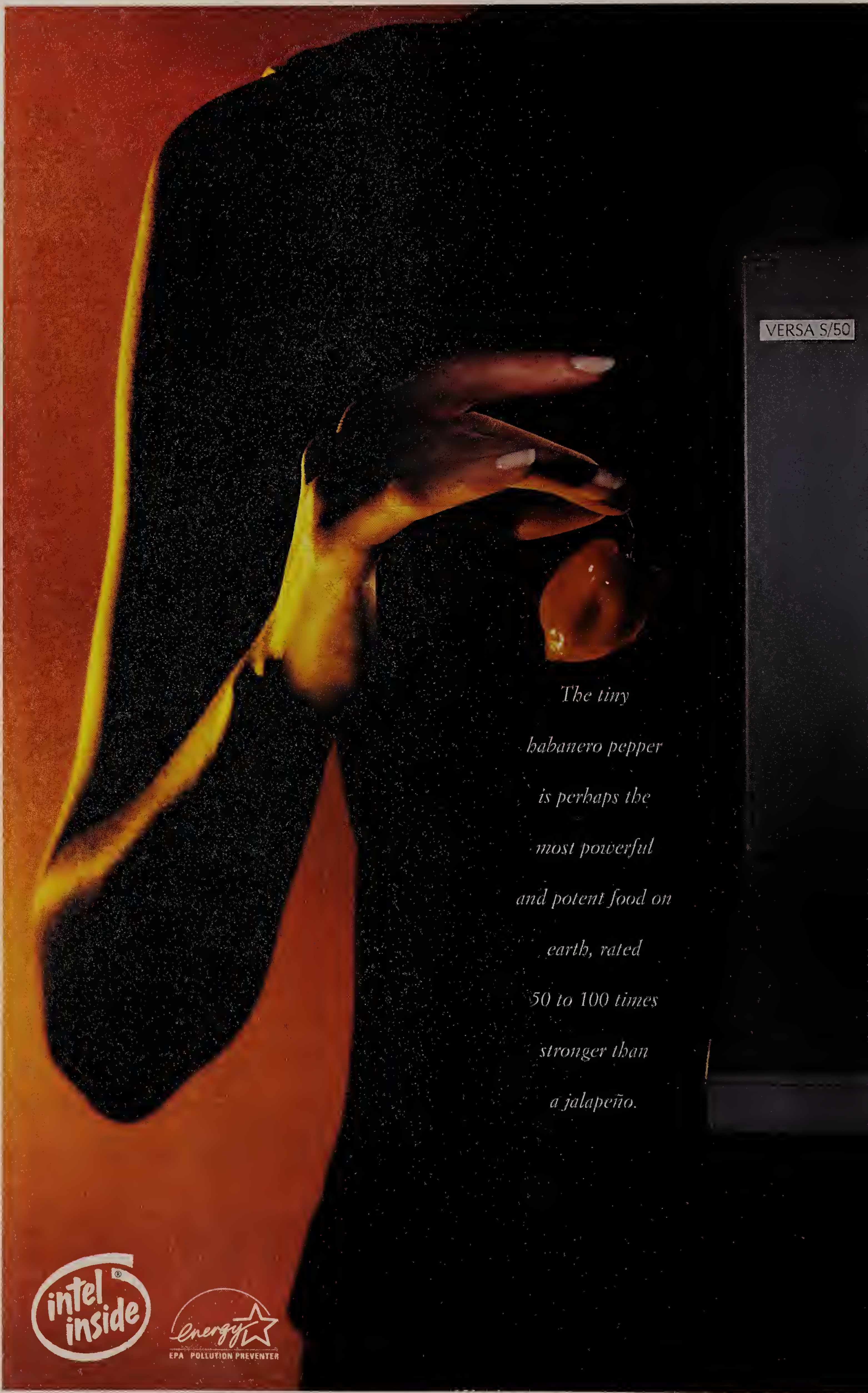
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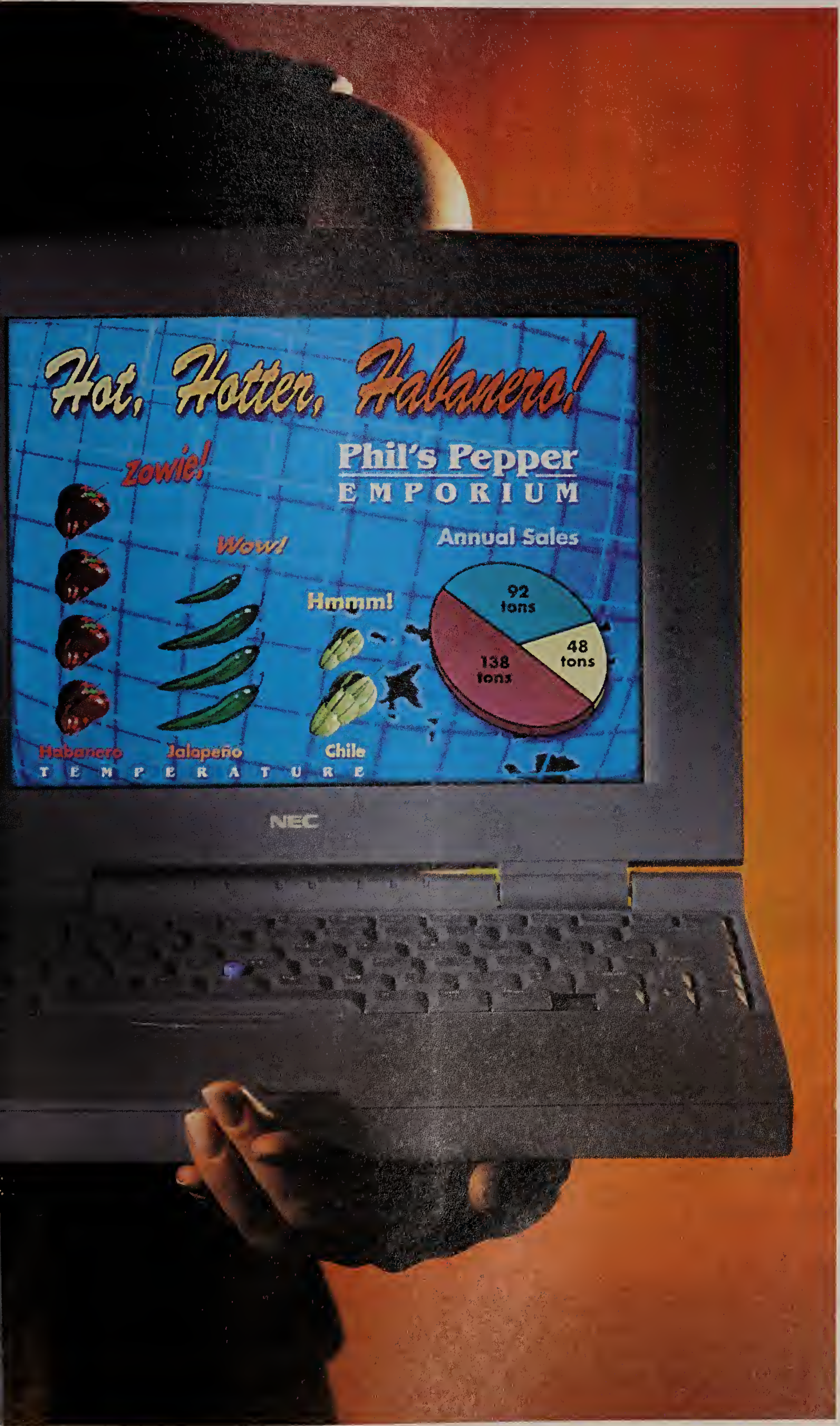
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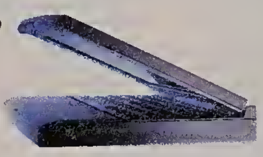

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New Products

Fibermux Corp. has announced the CC8814/1550 Common Logic Module for its Magnum 100 multiprotocol backbone multiplexer.

According to the Chatsworth, Calif., company, the module doubles the capacity of single-mode fiber-optic cable by interoperating with an external wave-division multiplexer.

The CC8814/1550 operates at 1,550 nanometers and can be combined with other fiber-optic signals that operate at 1,310 nanometers. It fits into all Magnum 100 chassis and can be run in a fault-tolerant mode that switches to a secondary module upon primary module failure.

The CC8814/1550 Common Logic Module costs $5,000.

▶ *Fibermux*
(818) 709-6000

Compu-Design Group, Inc. has announced TalkRemote, LAN-based, multiprotocol remote control software.

According to the Natick, Mass., company, the product provides PC-to-PC remote control access across the local- or wide-area network, regardless of network protocols or operating systems.

TalkRemote lets network administrators transfer data files or application software across the network, initiate remote training, applications or technical support and monitor user activity.

TalkRemote intercepts and transmits Windows device driver commands instead of copying Windows screen bitmaps across the network, providing minimal impact on network traffic.

Prices run from $16 to $104 per client.

▶ *Compu-Design Group*
(508) 655-1177

Meridian Technology Corp. has announced SuperLat for Microsoft Corp.'s Windows NT, a software utility that lets users access Digital Equipment Corp. applications and peripheral devices.

According to the Chesterfield, Mo., company, SuperLat emulates a serial communication port, which enables users to select a serial local-area transport port and connects them to any local-area transport device.

SuperLat also provides bidirectional printer sharing among Windows NT and Digital users.

Pricing starts at $225.

▶ *Meridian Technology*
(314) 532-7708

Digicom Systems, Inc. has announced Connection Pro, a software-upgradable multifunction modem.

According to the Milpitas, Calif., company, Connection Pro combines V.32 terbo data/voice/fax functions with audio on a single internal PC card.

The product can achieve full-duplex V.32 terbo data transfer rates up to 19.2K byte/sec. A digital voice messaging feature supports all high-speed data and fax modem requirements and answering machine functions with the use of a single phone line. Connection Pro lets users integrate multiple mailboxes and multiple greetings, and it features an autodialer and phone book.

Other features include V.42 data compression with data rates up to 115.2K byte/sec., V.42 error correction, 11-KHz and 22-KHz audio sampling rates and playback of 8- and 16-bit stereo files.

The product is compatible with the Windows sound system and lets users record voice annotation for documents and multimedia presentations.

Users can upgrade the Connection Pro board to support the Radish VoiceView protocol.

Connection Pro comes bundled with Delrina Corp.'s WinFax 3.0 communications software and RingCentral voice software for Windows.

Connection Pro costs $249.

▶ *Digicom Systems*
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Object-oriented technology

Cincom sketches plan to integrate Supra with Unisql's DBMS

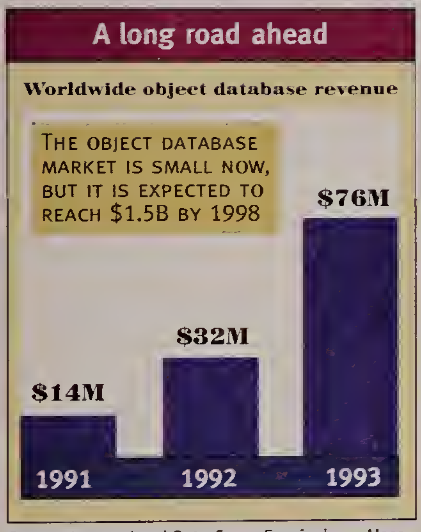
By Rosemary Cafasso

Cincom Systems, Inc. is taking initial steps into the object technology world, and customers are optimistic that the database management software company is moving in the right direction.

"Object technology is [where] we want to move to in the next two or three years," said David Sacco, MIS manager at the rolled products division of Alcan Aluminum Corp. in Cleveland. "We are waiting for more information," Sacco said of Cincom's object plans. "We are very interested in pushing Cincom to move. We've been encouraging them to stay current with their products."

Cincom quietly announced a deal with Unisql, Inc. late last month that calls for the two companies to codevelop technologies to integrate the Cincom Supra relational database management system with the Unisql DBMS, which is an object database designed to handle relational data as well as objects.

A long road ahead



Source: International Data Corp., Framingham, Mass.

Joint effort

While details of Cincom's efforts are sketchy, the company said the object strategy will involve several efforts. First, it will begin shipping the Unisql software to some Cincom customers who have expressed a need for an object-oriented system.

By October, it plans to announce the availability of interface technology that would link existing Supra databases with the Unisql environment. This would allow customers to access and update Supra data from within the Unisql system.

A company spokesman said additional integration efforts may be in the works, but he declined to provide details. As it stands now, Cincom users who want to continue to use and modify their existing Supra DBMS, and at the same time use the new object-oriented DBMS, need to keep and maintain the two separate DBMSs, the spokesman said.

Like its rivals in the traditional mainframe database market, Cincom has downsized its RDBMS to server platforms. Cincom's Supra does not rank among the Top 5 large system DBMSs. But the privately held company has 4,500 database customer sites, according to Marco Emrich, Cincom's senior director of application development and database software technology.

At its core, Unisql technology is an object-oriented DBMS that was designed to accommodate relational data. Rows of data from relational tables, for example, are stored with "object identifiers," so all data on a physical level is stored as an object, according to an Unisql spokesman.

Growth expected

While object technology has slowly gained acceptance in the commercial world, industry analysts expect it will grow in importance to correspond with increasingly complex data types from imaging, video and other sources. Unlike RDBMSs, object technology is more suited to store and manage large, complex data types.

"The problem today is that relational does a very poor job of handling complex data," said Richard Finkelstein, president of Performance Computing, Inc. in Chicago. "It's been fine-tuned for [on-line transaction processing], which is really just discrete records with simple data types."

Several Cincom users said they expect object technology to play a role in future processing requirements.

Good move

Lorne Johnson, data administrator at the British Columbia Automobile Association in Vancouver, said his staff has begun working with object programming languages, including Digitalk, Inc.'s Smalltalk. He said he considers Cincom's plans "definitely positive."

"We have been battling the problem of storing object-oriented technology," said Johnson, who oversees a Cincom Supra installation on Unix-based servers.

"The [relational] storage medium doesn't match the programming paradigm. We don't have an object-oriented database because they seem too immature for the applications we need. We are anxiously waiting to see if [the new Cincom database] will do what they claim it will do," he said.

Moving backup to the mainframe

Centralized distributed backup grows in popularity

By Mary Brandel

Phil Bone, systems analyst at American Family Life Assurance Co. (AFLAC) in Columbus, Ga., is doing something that might seem radical for LAN backup: He's turning to the mainframe.

Currently, he uses eight servers, which run Cheyenne Software, Inc.'s Arcserve, and 10 tape drives to back up 28G bytes of data every night.

But as the data grows and the applications become more important, "we're thinking consolidation," Bone said. "We put a lot of trust in our departmental LAN administrators, but I'd feel more comfortable" with a centralized approach.

Like a growing number of his counterparts, Bone plans to use mainframe-based enterprise backup software, which reaches into PC and Unix LANs to back up data on a central host. According to Peripheral Strategies, Inc. in Santa Barbara, Calif., 700 sites in the U.S. are doing the same thing. The idea is to apply mainframe rigors — such as automation, central control, security and reliability — to distributed backup.

Mainframes, for now

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*Projected

Source: Peripheral Strategies, Inc., Santa Barbara, Calif.

Local servers feed host

Some of the available systems also incorporate a second tier of backup at the Unix server level, which then feeds into a mainframe. For instance, Legent Corp. stripes backup data across servers in an enterprise and then sends the data up to the mainframe. New Era Systems Services Ltd. in Calgary, Alberta, recently added a midrange server as a local data gatherer for its mainframe-based Harbor system. IBM's ADSM software, which leads the market, works in a similar way.

Many large system software makers are making bids in what analysts are calling a booming market. Just recently, Boole & Babbage, Inc. purchased Stage 3, enterprise data management software from Emprise Technologies, Inc. in Bridgeville, Pa.

However, these systems do not appeal to everyone. Cost is a major deterrent for some.

"They knock on your door and say, listen, we've been building backup for MVS, and we're here to help you with NT," said David Greenberg, director of new systems development at Orlando Health Care, which backs up 50G bytes of data on 800 desktops and 52 servers at 13 facilities over a 60-mile diameter. "When I ask them about cost per seat, I hear $28,000 [for the server piece]. So I tell them" the company doesn't have seats like that, he said.

Benefits outweigh problems

To other customers, the cost is actually a plus. The average price of an enterprise backup system is $50,000 to $100,000, according to Michael Peterson, an analyst at Peripheral Strategies. But that cost is more than offset by reductions in manual labor, according to users.

At the Insurance Corporation of British Columbia, for instance, payback from using New Era's Harbor took just under two years, including salaries and the cost of the product and mainframe disk, said Lynne Bryant, telecommunications systems manager at the $2 billion North Vancouver-based firm.

The largest benefit, she said, is time saved backing up individual PCs, which Harbor does automatically. Before a user would have to manually insert disks, which could take two to four hours per week.

Allocating resources

At AFLAC, Bone said he estimated it would cost $200,000 over a three-year span to back up 1,000 workstations and 40 servers running various operating systems. "That's a significant amount of change," Bone said.

But Bone said he wants an enterprise backup system so that end users can automatically and easily schedule backups on their PCs. Cheyenne could do the job, but "how much human resources do you want to commit to backups and rotations?" he asked.

The average license for a mainframe-based enterprise data manager is 1,500

Mainframes, *page 70*

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IBM®

Mainframes

CONTINUED FROM PAGE 67

to 2,000 clients, according to Peterson.

But even these companies will run into a problem: network bandwidth limitations. "That's the challenge," said Glen McDermed, an analyst at Gartner Group, Inc. in Stamford, Conn. "Do you have networks fast enough to accommodate the amount of data you need to send in? You can't justify the cost of faster networks on backup alone."

AFLAC currently uses T1 links, and within the next year it will go to T3 or fiber links, which are sufficient for backup transmission, Bone said.

Secondly, he said, enterprise backup systems only back up redundant data, which means you are not transmitting a full load over the network every night.

Of course, you do not need a mainframe to get some of the benefits of enterprise backup software. Epoch Systems, Inc. and Legato Systems, Inc. use Unix servers to centralize backup for distributed Unix and PC LAN environments. Cheyenne has also described a strategy to provide enterprise backup from a PC LAN orientation.

"There's no question that the mainframe will be the biggest market through 1996," Peterson said. "But it will be surpassed by PC LAN software over time."

User benefits

Users list the following benefits of using mainframe-based enterprise data managers:

- **Less manual labor.** Daily backup functions are automated. The inherent savings justify the cost, users said.
- **Faster backups and easier restoration.** These systems do not back up all the data every night. Rather, they poll the network looking for redundant data, reducing backup loads by 30% to 40%, according to Michael Peterson, an analyst at Peripheral Strategies. When it is time to restore, the back end pieces the incremental backups together.
- **Ease of backing up individual workstations.** Users report easier backup of individual workstations.
- **Trusted media.** "On a mainframe, you have devices with high reliability," said Tom Bernhardt, technology analyst at Star Enterprise in Houston. "In LANs, the first time you have a 'read' failure is when you're doing a restore, which is absolutely the worst time."

—*Mary Brandel*

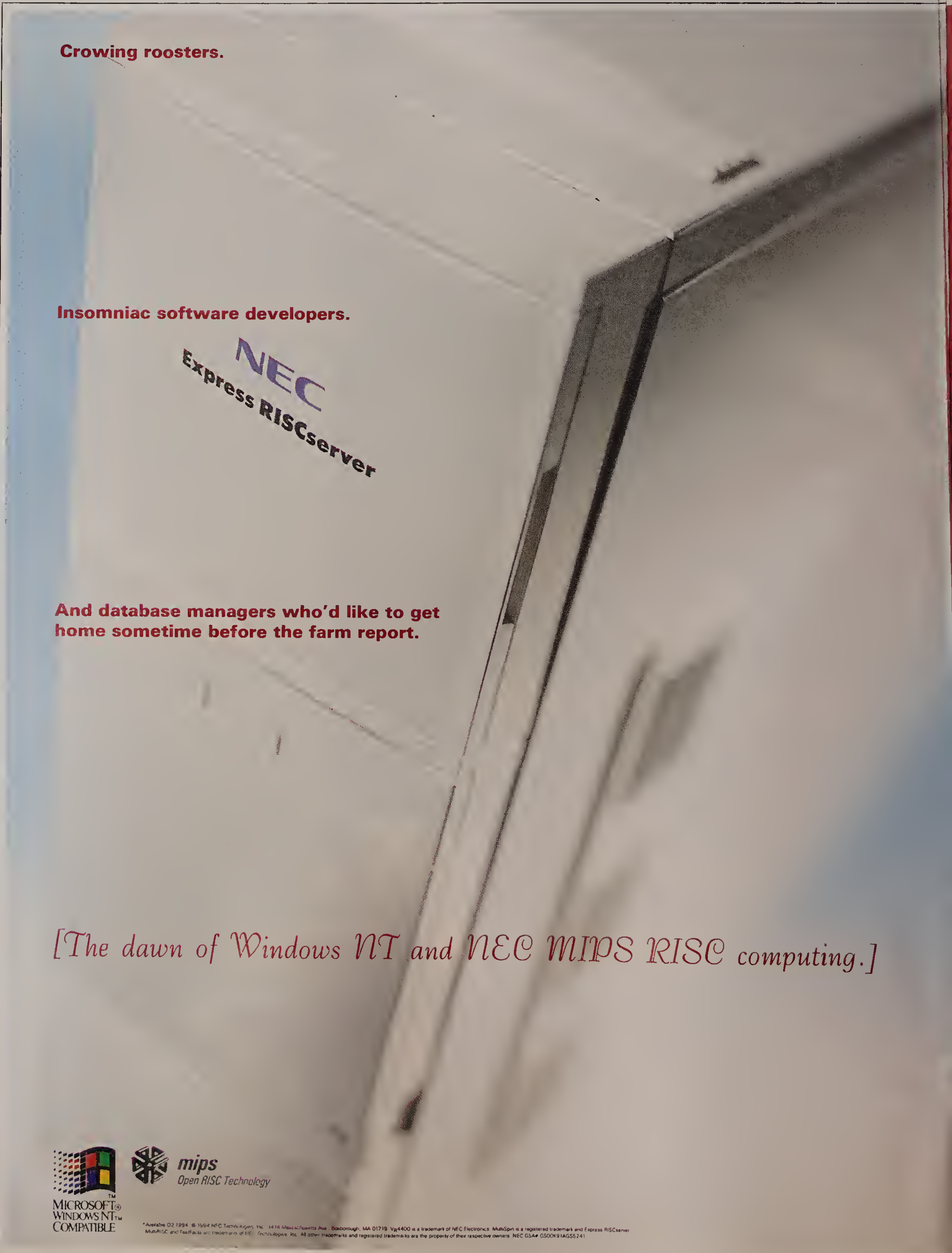
Briefs

OCS rewrites Express

Operations Control Systems (OCS), until now a maker of systems management software for Hewlett-Packard Co.'s HP 3000 computers, introduced a rewritten version of its Express automated job scheduler for Unix systems starting with the HP 9000. Releases for IBM's RS/6000 and Sun Microsystems, Inc.'s SPARC hardware are due to follow in September, according to OCS executives. Express starts at $5,000 and targets job schedulers included in one-stop-shopping products such as Computer Associates International, Inc.'s CA-Unicenter and Tivoli Systems, Inc.'s management framework.

Massive marketing

Intel Corp.'s Supercomputer Systems Division said it plans to increase commercial marketing of its massively parallel processors (MPP), which, until now, have primarily targeted engineering and scientific customers. Intel is looking for additional resellers to augment a deal signed last year with Unisys Corp., which plans to start shipping a machine based on Intel's MPP technology in the first quarter of next year.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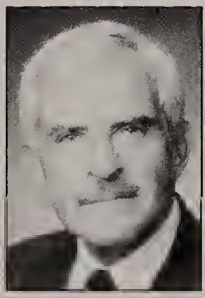
Commentary

Harold Lorin

No immunity for OLTP



In a summer when everyone is reflecting on D-Day and World War II, one can consider on-line transaction processing (OLTP) as the last defensible fortress of proprietary, text-oriented mainframe systems. The battle that looms is MVS old-style and VSE/CICS vs. everyone else, including MVS/Open for industrial-strength OLTP. The weapons are metrics such as cost of migration, cost per transaction and cost per user.

Unhappily, the metric is never profit per transaction or profit per user, and that is why we are sometimes misled. End-user interfaces associated with client/server are important where creativity and unstructured cognition are key. Graphics, imaging and multimedia spreadsheets are technologies for high net worth activities performed by highly paid employees.

Employees who use "commodity" OLTP applications are low-paid workers. Each transaction carries limited value. The work is standardized and repetitive. Productivity has no significant component. It is defined only by the transaction rate. The applications may be stable and a deep part of the company culture.

Marketing material for this point of view is easily countered by analysis that distinguishes between the cost of client/server and the cost of "open" — and that seeks distinction between the costs of distribution and decentralization.

Despite this, there is some basis for extending the life of older OLTP systems, which will remain stable and relevant until there is a business reason for change. The business reason will lie in the importance of end-user interfaces for profitability. This is not a porting issue or a Unix/no Unix issue. (Unix Top Hat and Tuxedo have been running OLTP for years, and now Unix is joining the CICS community.) It is an end-user value-added and cost-of-maintenance issue.

One flaw in the mainframe OLTP fortress is that low cost per user is commonly associated with low profit per user and the lack of value in pleasing the user. Any changes in business practices requiring a need to please the user will require the replacement or serious modification of older OLTP systems.

A brokerage that wishes to empower preferred customers to make their own trades will find that end-user attractiveness is a competitive weapon for the OLTP function. An insurance company that wishes to sell directly to end users requires attractive pictorial interfaces. As user interfaces become a competitive weapon, and as companies downsize, the low-paid employee paradigm fails, and the old OLTP fortress will crumble in the face of the need for direct contact with the market. The computer replaces the phone and mail as the source of revenue.

Changes in the end-user interface imply changes in communications protocols for multimedia, and as a consequence, the older OLTP applications are destabilized. Whether it is more cost-effective to replace them or modernize them becomes the key issue.

The choice is not when, but whether the move is made. Denial is not a sufficient strategy.

Lorin is an author, principal consultant at the Manticore Consultancy in New York and senior adjunct professor at Hofstra University.

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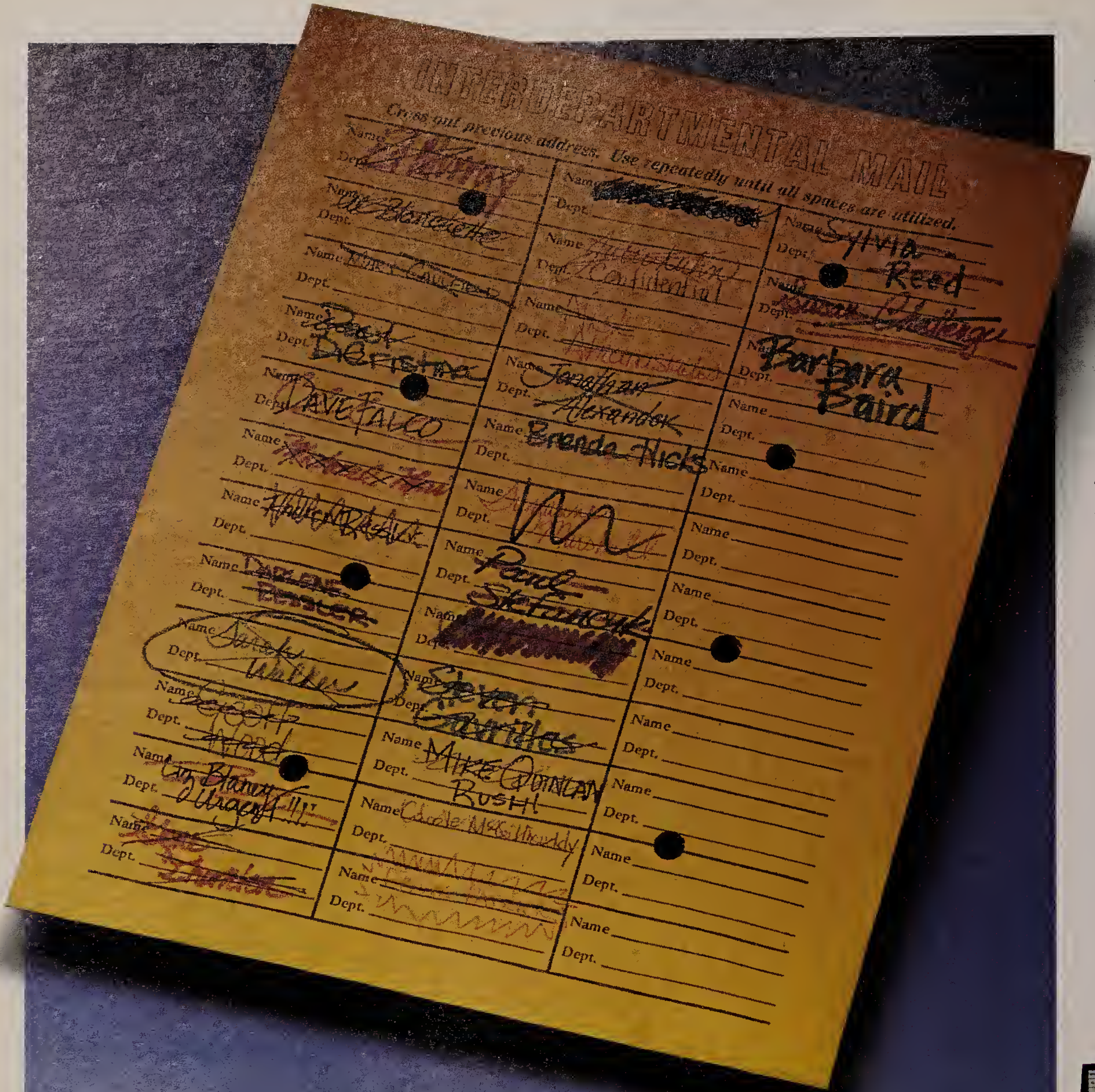
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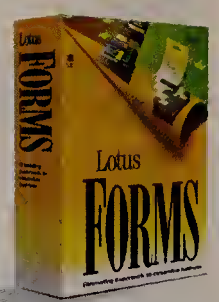
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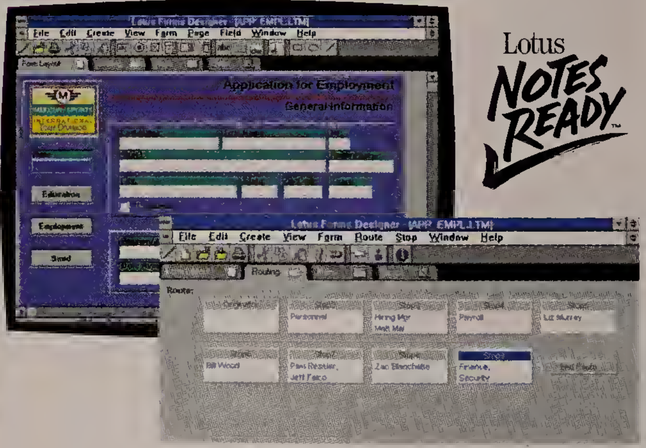
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New Products

Boole & Babbage, Inc. has announced StorageGuard 2.2, a direct-access storage device (DASD) storage product for MVS/ESA environments.

According to the San Jose, Calif., company, StorageGuard 2.2 combines comprehensive real-time storage monitoring, control for DASD space budgeting and historical data collection.

The product features a multilevel accounting structure, a list facility that provides greater detail about individual data sets, screen customizations and tracking of account information by storage group or data, and storage or management class.

Administrators can use StorageGuard 2.2 to monitor use, warn of excessive use, deny usage requests beyond a budget amount or view reports on-screen or through batch facilities.

The product provides information on account allocation-based totals; maximum, minimum and average use; allocated, free and ideal space; and used and volume fragmentation.

Prices range from $12,000 to $30,000.

▶ *Boole & Babbage*
(408) 526-3000

J. D. Edwards & Co. has announced Training and Development System, software for the IBM AS/400.

According to the Denver company, the system lets users develop curricula, course definitions and schedules for classes, facilities, students and instructors. The system also provides on-line viewing of class attendance records and student transcripts.

When integrated with the company's Human Resources Management System, users can update their student/employee training records on a PC, which updates the master file on the mainframe.

Prices start at $5,000.

▶ *J. D. Edwards*
(303) 488-4000

BMC Software, Inc. has announced Patrol 2.0, a database monitoring and systems management tool.

According to the Houston company, Patrol 2.0 lets users centrally control distributed computing environments.

Patrol 2.0 uses a central console, intelligent-agent technology and loadable libraries of system expertise to monitor and proactively manage servers, key resources, databases and applications.

Each remote agent monitors and reacts to server-based objects with little communication to the central console, reducing network traffic. A parameter scheduling feature lets users schedule tasks on single or multiple computers.

Patrol 2.0 supports Sybase, Inc., Informix Software, Inc., Oracle Corp. and Ask Computer, Inc.'s Ingres databases. Users can customize Patrol 2.0 to monitor and manage relational database management systems not currently supported by the product.

Prices start at $10,000. Consoles and agents are priced separately.

▶ *BMC Software*
(713) 918-8800

Product short

Six Sigma CASE, Inc. has announced Canonizer for Cadre Technologies, Inc.'s Teamwork, a database design tool for modeling, database conversion and migration, re-engineering and client/server design. Cost: $4,995. Six Sigma CASE, Bellevue, Wash. (206) 643-6911.

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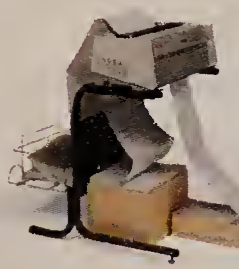

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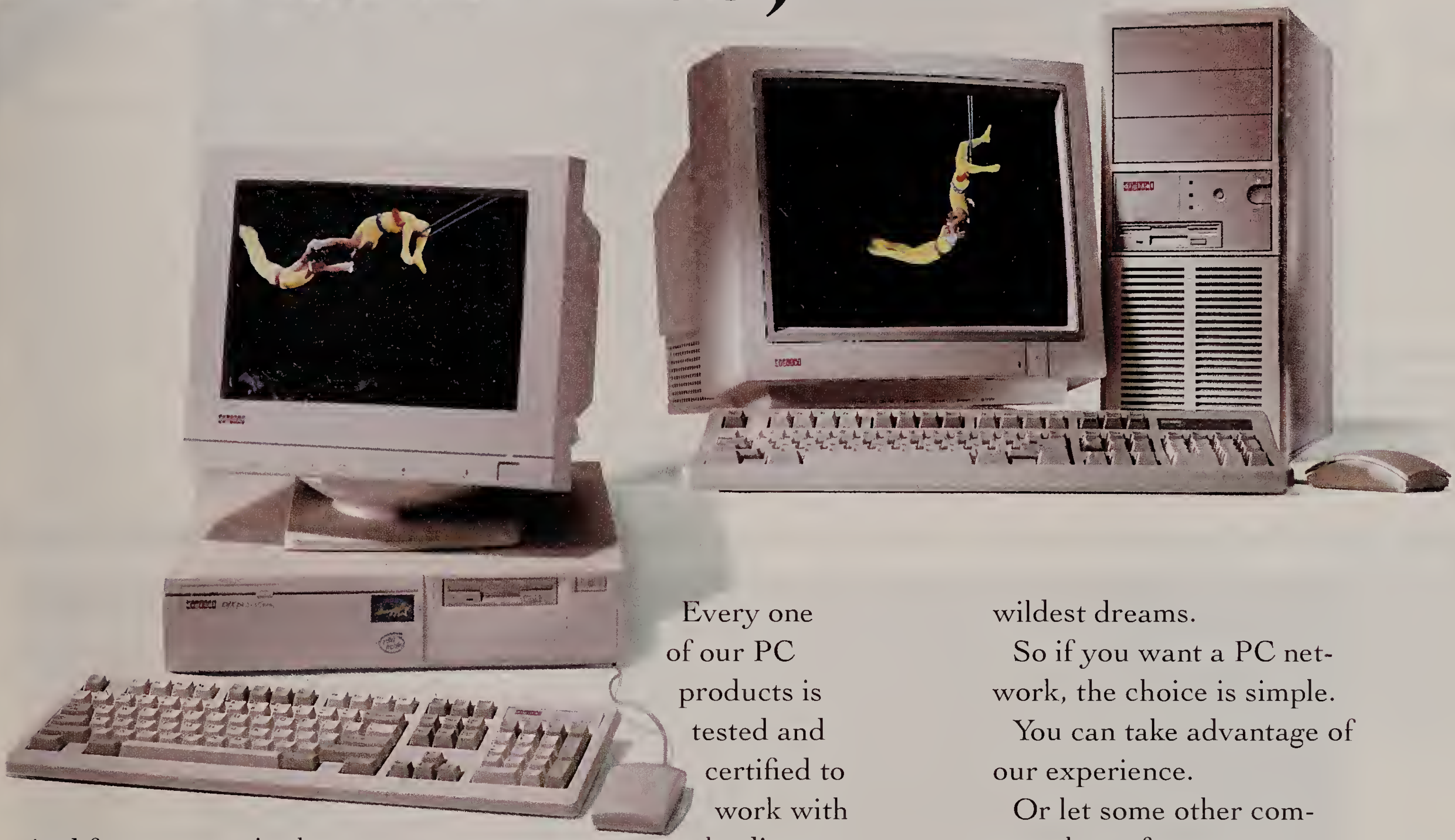

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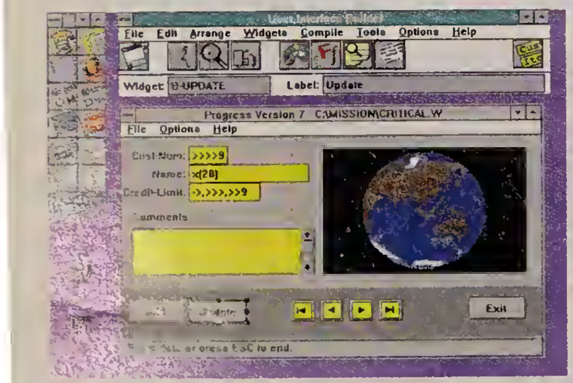
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PROGRESS
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Client/server testing booms

Environment complexity spurs GUI tool updates

By Melinda-Carol Ballou

Testing software in client/server environments can be a major headache for developers. Adding to the usual issues — such as unexpected glitches resulting from code changes intended to fix problems — is the complexity of distributing applications across multiple clients and servers and a range of networking protocols.

Anything that will help manage this problem is generating a lot of interest in the developer community, analysts said. According to the The Yankee Group, a Boston consulting firm, 80% of developers are interested in bringing in automated testing tools to help them deal with the problem. But only 20% have already done so, despite the difficulty and inaccuracy of testing applications manually even in a traditional, mainframe-based development scenario.

"It's a huge challenge for developers to write and then deploy code in client/server environments," said Tim Harmon, an analyst at Meta Group, Inc., a consulting firm in Burlingame, Calif. "There's networking incompatabilities and inconsistencies, database issues and user interface problems."

Feeding demand

And as the complexity of testing applications increases, vendors of graphical user interface-based products are coming out with new releases of their testing tools.

Earlier this month, for instance, Mercury Interactive Corp. released a series of products under its Enterprise Quality Architecture, including Version 3.0 of its WinRunner testing tool and TestDirector, a workgroup test development and management system. In May, Segue Software, Inc. began shipping QA Partner 2.0, a tool that allows the company to focus on corporate developers instead of on its traditional market of independent software vendors. Software Quality Automation will ship a new tool release in September.

The new version of WinRunner, coordinated with the other Mercury products, targets the testing of applications in client/server distributed environments.

According to Mark Tomlinson, a quality analyst at Norwest Mortgage, Inc. in Des Moines, Iowa, the new version of WinRunner is much easier to use. Improved features include a new tool bar to maintain records and tests, Visual Testing and a function generator.

Visual Testing is a point-and-click technology that allows developers to create tests and verify applications. The function generator automates the testing of application requirements and speeds up the development process, Tomlinson said.

"When you check the validity of requirements from Day 1, that's what saves you money," Tomlinson said. "You stop a potential bug before it's written. You fire up the tool, automate the application requirements and see if the software meets the requirements." And if the software does not stack up, the developer can change it.

Mercury also announced LoadRunner/PC, which lets developers test multiple clients on different networked PCs. Other developers, however, look forward to multitasking support when LoadRunner/PC is released for Microsoft Corp.'s 32-bit Chicago operating system. This will allow them to simulate multiple software loads on a single PC.

"Right now, it's not quite what we would want because you're still loading up many PCs, and the technology isn't there to simulate several versions running on one PC," said Kerry Zaller, senior systems analyst at Pacific Bell offices in San Ramon, Calif.

Major players in the GUI test tool market

VENDOR	PRODUCT	PLATFORMS SUPPORTED
Mercury Interactive Corp., Santa Clara, Calif.	XRunner, LoadRunner	Most major X11 Windows hardware
	WinRunner	PC or PC-compatible running Windows 3.0 or higher
Segue Software, Inc., Newton Center, Mass.	QA Partner	22 major hardware platforms, including X11, Windows, OS/2 and Macintosh
Software Quality Automation, Inc., Woburn, Mass.	TeamTest	PC or PC-compatible running Windows 3.0 or higher
Sterling Software, Inc. Chatsworth, Calif.	Answer: Testpro	PC or PC-compatible running Windows 3.1 or higher
Other vendors include AutoTester, Inc., Dallas; Softbridge, Inc., Cambridge, Mass.; Veritas Software, Santa Clara, Calif.		

Source: International Data Corp., Framingham, Mass.

Help is on the way for OLE 2.0 development

By William Brandel

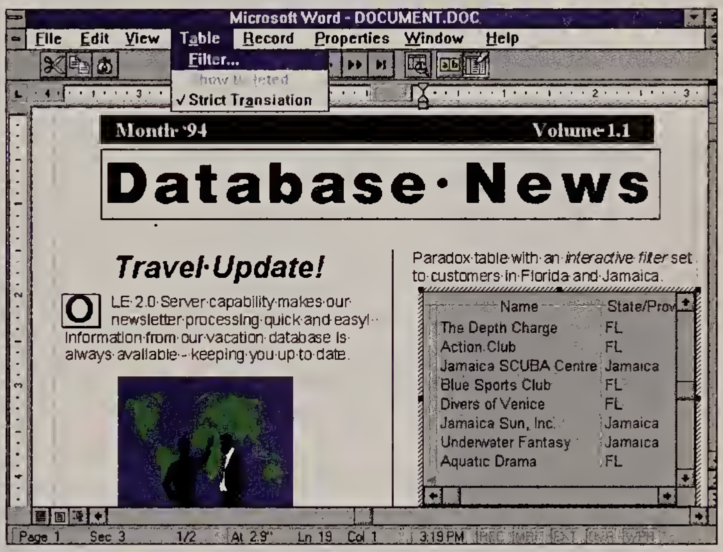
By almost anyone's measure, Microsoft Corp.'s Object Linking and Embedding (OLE) 2.0 will become a standard integration technology for Windows-based desktop applications. But how and when that will happen depends on how soon tools will be available for corporate and commercial developers to integrate the technology into their applications.

As it stands, OLE 2.0 development is a complex, difficult and resource-demanding specification. At the same time, the classes and libraries that Microsoft has made available to developers fall way short of their needs, developers said. Many developers liken the OLE 2.0 migration experience to taking their applications from DOS to the graphical Windows environment.

"It's as big as anything as I've ever seen," said Larry Barbetta, president of Prodea Software Corp. in Eden Prairie, Minn. "You have to break the application into objects and then decide on which functionality to expose and how."

The documentation alone for the OLE 2.0 specification fills 1,400 pages and encompasses 400 different interfaces. To alter a Windows 3.1 application to support any OLE 2.0 function involves tens

OLE 2.0, *page 78*



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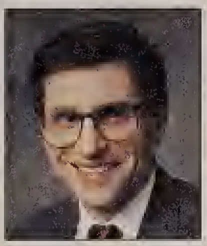
Aquatic Drama	FL

Paradox 5.0 for Windows *has been OLE 2.0-enabled, using Borland's not yet delivered Object Component Framework*

Commentary

Richard Finkelstein

Can database tool vendors deliver?



Choosing database server front-end tools has never been more difficult. Relational database management system and third-party vendors continue to pour resources into building application development and front-end tools, but the results so far have been lackluster. The present crop of tools are difficult to use (much more so than one is led to believe by slick demos), perform poorly and are very buggy.

The problem is that vendors are too busy chasing their own marketing hype and are not delivering sound, focused solutions.

In the past, character-based development tools from RDBMS vendors were pretty reasonable. RDBMS vendors used their knowledge of their database engines to build tools that were reliable, maximized the use of the RDBMS features and provided good productivity. However, the RDBMS vendors have fallen behind in upgrading those tools, especially on GUI platforms.

Double trouble

Two major engineering hurdles are hindering RDBMS vendors. Because they have a large customer base on dumb terminals and DOS PCs, they must try to maintain backward compatibility between their new GUI tools and their older character-based tools. They must also live up to their own marketing hype and design products that can run on dozens of different devices and operating sys-

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OLE 2.0

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of thousands of lines of code.

The specification is complex because Microsoft is trying to bridge the Windows applications on the market with an object-based integration technology. In doing so, Microsoft had to provide a broad specification that would encompass as many different Windows applications and their technical caveats as possible.

"For example, there are so many different ways that vendors deal with fonts," said Doug Enrich, director of Microsoft's developer relations group. "It's a complex issue. We could not even get a handful of major players to agree on exactly how to implement this" in OLE 2.0 applications.

Grin and bear it

Many commercial developers do not like that the OLE 2.0 specification is complex yet has technical shortcomings. However, they slog onward because it is widely believed that OLE 2.0 will become a checklist item on all future desktop applications, said Matt Cain, an analyst at Meta Group, Inc., a Westport, Conn.-based consultancy.

At the same time, corporate developers are not under the same pressures to develop for OLE 2.0. Many say they are content to simply deploy shrink-wrapped applications that take advantage of OLE 2.0's component integration functionality.

Also, as most corporations struggle to keep up with their programming load for mission-critical applications, it is unlikely that corporate programmers will dig into the fledgling OLE 2.0 development soon, said Heidi Dix, an analyst at the Forrester Research, Inc. in Cambridge, Mass. About 3% of information systems sites employ programmers with object-oriented experience, she said.

However, this environment may change as OLE 2.0 development tools become available in the next 18 months. For example, Gupta Corp. and ASK Computer Systems, Inc.'s Ingres Product Division are working on tools to help developers incorporate OLE 2.0 functions into applications, as well as products that take advantage of OLE 2.0 functionality. Gupta plans to deliver OLE 2.0 products by the end of this year, while Ingres is aiming for next year.

A big drop

The best hope in the short run may rest in technology that Borland International, Inc. is developing. Officials there say they can deliver a set of classes and libraries that will make OLE 2.0 development dramatically easier.

Object ORIENTED programming

Dubbed the Object Component Framework (OCF), the tools will work with Borland's C++ tools and enable a C or C++ programmer to OLE 2.0-enable their applications, said Michael Himan, business unit manager for languages at Borland. Himan contends that OCF can cut the lines of code necessary to OLE 2.0-enable an application from 35,000 to a mere 16.

Borland's OCF is not yet in beta testing, but some of the classes and libraries that will be in it when it ships this fall have already been proved effective in field tests. For example, WordPerfect Corp. and Novell, Inc. used the tools to integrate OLE 2.0 features into five of the applications in the PerfectOffice suite. A WordPerfect official said using OCF cut the development cycle down from many months to six to eight weeks.

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New Product

Pilot Software, Inc. has announced Lightship Professional 4.0, a Windows-based graphical user interface.

According to the Cambridge, Mass., firm, the product accesses and analyzes data from multiple sources and formats.

Features include geographic mapping, programming advances and enhanced three-dimensional graphics.

Lightship Professional 4.0 lets developers make data more easily accessible for comprehensive data searches and simpler to present or view.

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CONTINUED FROM PAGE 77

tems. Not only are these operating systems constantly changing, but they are also often unstable. The results of their efforts have not been encouraging.

Oracle's tools are competent but clunky. Informix 4GL and 4GL/Windows wore out their welcomes a long time ago. Sybase's BuildMomentum is long overdue and probably in deep trouble. Ingres' tools looked interesting for a while, but unfortunately there seems to be no one left to sell or support them.

Customers, who find the RDBMS vendors' offerings inadequate, are increasingly turning to third-party vendors. But problems exist with them as well. Third-party vendors design their products so they can work with several RDBMSs. This forces them to use a lowest-common-denominator (LCD) design that does not work well with RDBMS-specific features such as stored procedures, triggers and specialized SQL capabilities. Compromised solutions impact performance, ease of use and reliability.

In some cases, I have found that third-party vendors simply do not have adequate knowledge of all the RDBMSs that they claim to support. In my own product evaluations, I have come across two products that generated incorrect multiuser code and exposed the database to lost updates and data corruption. Customers who assume that third-party vendors know enough to design tools for a multitude of DBMSs are in for a shock.

The only way to improve tools is for vendors and customers to become more focused. Rather than dilute efforts by trying to develop tools that run on hundreds of platforms against dozens of DBMSs, they should concentrate on tools that run well on one or two platforms against a limited number of DBMSs. By controlling the number of variables, a vendor increases the likelihood of delivering a quality product.

Vendors that are focused tend to do better. Microsoft focuses on Windows and, secondarily, Macintoshes and has been able to deliver many highly regarded desktop tools. The major weakness in Microsoft's product line is that its client/server tools are restricted to LCD Open Database Connectivity (ODBC) database server interfaces. Microsoft has made several announcements indicating a future shift from ODBC to OLE 2.0 in its own Access and SQL Server database engine interfaces. Microsoft will use OLE 2.0 to integrate its tools with its database engines, leaving the rest of the industry to figure out how to use ODBC.

Rather than dilute efforts by trying to develop tools that run on hundreds of platforms against dozens of DBMSs, vendors should concentrate on tools that run well on one or two platforms against a limited number of DBMSs.

Short list

Oracle has recently shown a shift from its one-size-fits-all strategy to a more Windows-focused view of the world. Oracle made a strategic decision to push for a first release of its own Cooperative Development Environment (CDE) development tools on the Windows platform and only recently began shipping Unix versions of CDE.

Oracle has also announced a desktop product, dubbed Project X, that will doubtlessly be optimized for Windows in order to compete against Microsoft's Access. Oracle realizes that to compete against Microsoft, it has to deliver best of breed, which means substantially curtailing its multiplatform LCD approach.

Customers evaluating tools should ignore long feature lists and look for products that focus on strong solutions for a short list of targeted platforms. If a product claims it can support 50 platforms and 40 DBMSs, it supports none of them well. Quality products are difficult to build, and only those vendors that concentrate on delivering well-focused solutions can really deliver the goods.

Finkelstein is president of Performance Computing, Inc., a Chicago consultancy specializing in client/server technology. He can be reached by CompuServe at 72240,2536.

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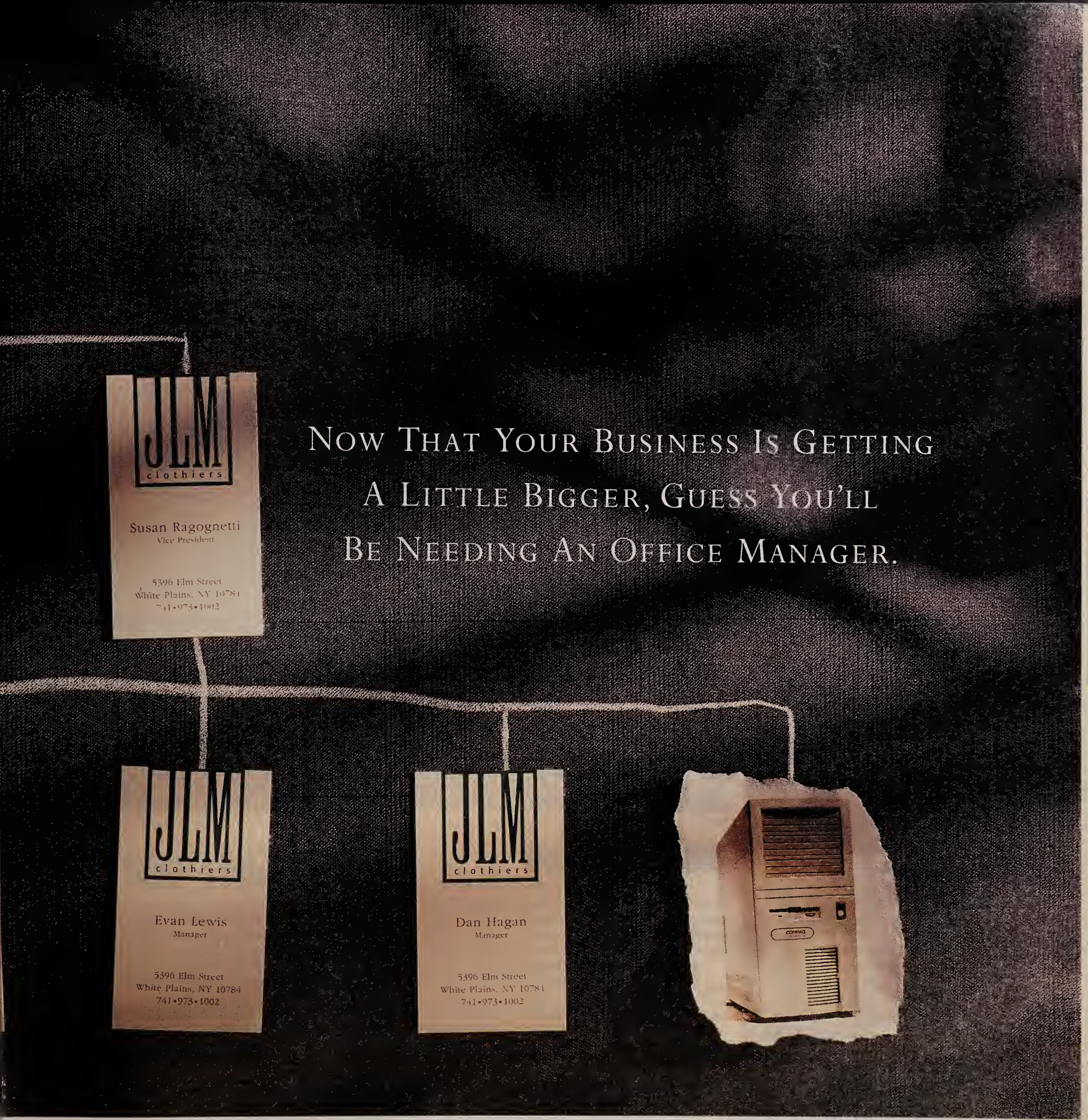

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Management

What's life like for an IS executive? It's small victories and last-minute snafus. It's constant encounters with watchful staff members and willful managers. It's . . .

a day in the life of MARY JO GREIL

Editor's note: When we considered an article on managing organizational change, we decided to do more than just analyze the topic. We wanted to *show* what it takes. What better way to do that than to follow an information systems executive for a day and report on what we saw?

So *Computerworld* asked Mary Jo Greil, manager of Planning and Controls at International Paper Co. in Memphis, if one of our reporters could stay by her side for a day — sitting in on her meetings and conversations, asking her and the people she met with what was going on in their minds.

Why did we pick Greil? She has survived five years in the change-management trenches at International Paper. During that time, IS has evolved from being perceived as an operation that "took too long and cost too much," Greil says, to winning the company's No. 1 quality award two years running. And she is highly regarded by her peers in the Society for Information Management.

With the consent of her boss, Chief Information Officer Karl Moore, and the hope that she'd learn from the experience, Greil agreed to our request — provided that we not portray her as a model manager who single-handedly changed International Paper's IS organization.

"The real strength of our quality effort is that it's not all being managed by Planning and Controls," she says. "It's infused throughout the organization. And we have facilitators who understand how to bring quality into the daily lives of people in the organization."

Mary Brandel, a veteran *Computerworld* editor and reporter, took on the assignment and flew to Greil's office in Memphis to spend a day with her. What did we learn? Quite a bit, but a few lessons stuck in our minds: that every interaction with another employee is an opportunity; that managers with high expectations can never stop encouraging their staffs; and that if you want to keep up with Mary Jo Greil, you'd better wear a comfortable pair of shoes. —*Allan E. Alter, Senior Editor, Management*

By Mary Brandel

Mary Jo Greil is a hard woman to keep up with — even when she's lugging a briefcase, a bulging tote bag and a portable computer.

Greeting co-workers, broadly smiling, she conducts five-second meetings and even some brief social visits on the short trip from the parking lot to her first-floor office, walking backward to keep up her pace: "Were you able to get that benchmark?" "How's your mother?" "A business presentation class — great!"

It all seems rushed, but when managing change is your job, every second and every interaction matters.

Greil joined International Paper in 1989 to head management services, which was in charge of training, communications, financial controls and quality for information systems. At that time, the organization was reeling from the relocation of four data centers to this one in Memphis. The relocation prompted a 50% IS staff turnover, including many who didn't

What makes Greil a leader?

We asked Mary Jo Greil's boss, CIO Karl Moore, that question, and he had the following to say:

proactive approach

"She decides what needs to be done and gets on with it. In other words, she organizes what needs to be done and executes in order of importance."

strong change agent

"She constantly challenges the processes and seeks ways to eliminate those that are not necessary and improve those that are important."

high energy level

"She is probably the most productive individual I have ever been associated with in my 34-year career."

win/win outlook

"She always works from a win/win position."

can-do attitude

"Has a very positive and can-do attitude. She has the ability to instill this attitude in others."

Mary Jo Greil *and CIO Karl Moore, left, share a similar view of how to propagate quality throughout IS*

JACK KENNER

want to make the move South.

At the same time, new Chief Information Officer Karl Moore had transferred from the finance side of the company, and he had new ideas about what IS could do for the business. Moore needed someone to help him turn his ideas into reality. He chose someone whose vision for the organization matched his own: Greil.

In four years, Greil established an "organization architecture" to carry out the vision of change. These include work force development initiatives, improvements in internal communications, measurement programs, strategic planning and process management. She broadened the charter of her group to emphasize planning, consistency across IS processes (such as service-level agreements and customer satisfaction surveys) and a process orientation rather than a functional orientation. These efforts still continue today.

"This is a personal mission for me," she says, referring to her role in carrying out Moore's vision of a low-cost, quality-driven, customer-centric IS organization. "I couldn't do it otherwise."

Her belief is that "the quest for quality" will take on a life of its own as others take responsibility for carrying it out. "It's as though we're mining for gold, and as we free people, we free their talents, and the nuggets just fly. Wouldn't it be great if our IS organization could serve as a prototype of an environment that cares about its employees and [where] the employees care about the success of the company?"

Today, March 7, Greil has flown back from Purchase, N.Y., where she has been involved in the first part of a three-month corporate re-engineering planning effort. She is back in the office for one day to catch up with her staff and the many projects in motion.

7:50am

On the way to her office, Greil calls hello to her assistant, Doris Walker, and apologizes for the pile of work that awaited Walker earlier this morning. As usual, Greil was in over the weekend. "I log 60 to 65 hours per week," she says, including a full day on Saturday. "I did back off from Sundays, though."

"She's going to make you dizzy," Walker says as we hurry down the hall. "You should have brought roller skates."

In Greil's office, a metal sculpture, various awards, family photos and pictures of skiers — Greil is an avid skier — adorn the walls.

In the bookcase is Edward Deming's *Road to Continual Improvement*. And to the left of Greil's desk hangs a blue pennant reading "Information systems — world-class quality."

9:00am

First on the agenda is a staff meeting in the conference room with Greil's three direct reports: Vicki Meyers, manager of management services; Mike Lattanzi, manager of systems planning and development; and Lisa Ciochetty, manager of financial controls.

The three managers drink from blue paper cups emblazoned with the words "IP Quality." And wherever you look in the room are lists enumerating IS mission statements, vision statements, goal statements and ground rules. Greil called on a consultant and the staff in general to come up with the content of the lists.

The weekly staff meeting is one of the few times during the week that the staff can share with Greil their progress reports, coordinate projects and discuss any important issues that arose from Greil's meetings with the top IS managers.

And there's plenty for the managers to report on. As Lattanzi puts it, "Working for Mary Jo is like juggling 15 balls at once. She is constantly trying to think four and five steps ahead of everybody else and a lot of times will set people off in research-type directions. As you can probably guess, these are sometimes a dead end."

While Lattanzi calls this a "very dynamic environment," it can also be frustrating. "I hate to leave anything three-quarters done. But by necessity, it's what you have to do because priorities change," he says.

As she listens to the managers speak, Greil is upbeat, smiling, nodding and responding with an occasional "Touchdown!" or "Thumbs up!" But she is also walking a fine line between encouraging her staff as well as challenging them.

"At these staff meetings, I take the opportunity to stretch the staff's thinking, challenge their ideas, make sure we're on track," she says. "It would be nice to sit back on our laurels and say, 'Isn't this great,' but the business pressures are really not allowing that."

As with any difficult job, the results are mixed. Greil's high expectations — which Lattanzi calls "relentless" — are clearly a driving force. At the same time, "We would like more of her appreciation for individual achievements, even those that seem insignificant," Meyers says.

The problem is magnified by the fact that "not all managers immediately embrace the new initiatives set forth by the group," one

Mary Jo Greil, *page 84*

Mary Jo Greil

CONTINUED FROM PAGE 83

manager explains. "So because we sell these ideas at the grassroots level, we have to take satisfaction at the grassroots level."

"I try to [give feedback and encouragement,] but it's never enough," Greil says. "My staff has its own unique challenges in bringing about change in the IS organization. Our customers [the rest of the IS staff] are sometimes feeling the work pressures of working with their customers [the business departments], and we need to be sensitive to their time constraints but still get things done.

"There's some tension that occurs from being pulled and stretched like that. And the work load is so heavy that it's difficult to balance the work requirements with trying to meet the needs of the staff."

10:00am

Before the meeting closes, Greil asks the three managers for five more minutes to consider a diagram that she would like to present to Moore in their meeting this afternoon. This diagram, she says, visually depicts the current IS communications flow and also the challenges the group faces in implementing organizationwide change.

She shows how directives from the CIO's office flow first to her group, making it their responsibility to announce and then facilitate change. Instead, Greil suggests that all the staff groups should hear about directives straight from the top, with her group merely facilitating action.

"I was using a visual that would help communicate a more effective communications approach to affect change because it comes from a group who should be the sponsor of change, not the initiator," Greil says.

Getting away from the hubbub of the office, she tells the group, has reminded her that even great employees won't get much done if the processes and structures are not right.

With some discussion and one small tweak, the group approves the diagram.

10:15am

We return to Greil's office, and she uses the half hour before her next meeting to check her voice mail and make a battery of phone calls.

The conversations are detailed, full of suggested contact names or references to conversations she may have had with other co-workers. With her time constraints, Greil says, "A moment in the hallway can give you all you need to know or can just be a chance to pass on some info."

But she mixes her serious approach with conspiratorial, ironic laughter. "I do like to have fun, and I don't get enough of it sometimes," she says. "If you can have those few minutes of camaraderie, just a personal connection, well, it keeps you sane."

10:30am

Lattanzi stops in for a briefing on IS measurement, an effort he will shoulder in her absence.

This type of handoff, Lattanzi says, would likely not have occurred if it weren't for Greil's three-month special assignment.

Greil attributes that partly to her own nature of wanting to stay aware — "I can be a detail-oriented person if I need to be," she says — but mostly to the corporate culture.

"The culture of the company is one of micro management," Greil explains. "There's an expectation of your being able to articulate some of the specifics going on in the organization."

International Paper as a whole is seeking to become more team-oriented. "As the culture continues to change, we're starting to focus on a critical few key factors, and the accountability of the details will start to shift more to other employees in the organization," Greil says.

JACK KENNER

Greil *calls assistant Doris Walker, left, her 'pillar of strength'*

Letting go "is a challenge for her," Meyers says. "But Mary Jo has done a good job of developing our ability to handle these situations, and she needs to recognize we've come into our own and can take this on."

At the same time, Greil says, "Sometimes people want their independence too soon because they're afraid they're not going to get it."

So before letting go, Greil sets the stage, alerting her reports to political obstacles, customer needs and inner workings of the IS organization. Being detailed at the beginning is key to lightening work loads later, she says.

"If I can start people off in a solid way, it's much faster for them to learn and become independent sooner," she says. "Also, I don't have to then be as concerned about follow-up and details because they are ready to be accountable for their actions."

In this case, she explains to Lattanzi that the measurement effort cannot be too inwardly focused, and it needs to measure key performance indicators that should then be linked to the IS strategic plan.

She advises him on how to work with Moore and encourages him to read a document on measurement from the corporate quality department. Later, she paves the way for Lattanzi in conversations with Moore and other IS managers.

12:45pm

After a rushed but social lunch in the cafeteria — the servers seem more accustomed to wrapping her a sandwich to go — Greil makes a quick stop in her office to prepare for an afternoon at the Towers, an International Paper facility just 10 minutes away.

She makes some phone calls concerning a presentation she will attend tomorrow morning. For the past year, Greil has worked with the task team in Liquid Packaging to help them apply the IS methodology to develop their business systems plan. At tomorrow's meeting, the co-leaders of the team will present the results from the business planning effort. She is not involved in the presentation but wants to be familiar with its contents.

Mary Jo Greil, *page 86*

The rising bar

"Quality is a journey. The bar is continuously rising — both within the company and among other information systems organizations."

Mary Jo Greil

In order to change its command-driven management style to one of high-performance work teams, the IS department at International Paper is:

- empowering employees
- becoming process-oriented
- participating in strategy planning
- continuing selective benchmarking
- identifying and managing performance
- focusing on business partnerships

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Mary Jo Greil

CONTINUED FROM PAGE 84

2:00pm

At the Towers, we meet with Page Williamson, director of business operations, Printing Papers, which she describes as "our biggest, most influential user."

Two-and-a-half years ago, the relationship between Printing Papers and IS wasn't exactly friendly. "We didn't always fully understand their needs, and they didn't always understand our resource constraints," Greil explains.

With a former IS manager, Williamson helped to develop the use of service-level agreements, which are formal agreements between IS and business customers to meet certain requirements. "They are designed not to be contractual but rather to improve communications and the relationship with that customer," Greil explains.

Since then, "Page has been very forthright in describing the improvements in performance and service levels from IS as a result of improved communications," she says.

Today, Greil wants Page's opinion on a new form she has devised to survey customers after a project is completed to determine their level of satisfaction. At the same time, Greil wants to make sure her group doesn't come across as survey-happy, she says.

The conversation strays into the possibility of using service-level agreements for the application development group, something Williamson strongly favors.

Greil is energized by the discussion: "For someone like Page, a customer, to say he really wanted service-level agreements in development . . . I felt like we were on the same song sheet."

3:20pm

The unexpectedly long conversation has made us late for our meeting with Moore. The centerpiece of Moore's office is a print of Babe Ruth, Lou Gehrig and Miller Huggins sketched at the New York Yankees' Florida training camp. "He's a real baseball nut," Greil says.

But Moore seems more proud of a recent diagram comparing International Paper's operations in [illegible], when five mainframes housed [illegible] MIPS and 545G bytes, and today, when one mainframe supports 210 MIPS and 714G bytes.

Then arrives the moment Greil has been waiting for: She shows Moore the diagram she has reviewed with her group and explains to him the opportunity for improvement she sees in the organization's communications flow.

JACK KENNER

Greil *talks with Page Williamson, a director at Printing Papers, who worked with IS early on to create a productive relationship*

The diagram catches Moore's eye, but while he agrees to some changes, he's not completely on board. He likes the consistency achieved by Planning and Controls relaying messages of change.

Greil is happy to get Moore's feedback. "We work closely enough together that we're pretty much on target with our thinking," she says. "He makes some requests, but usually I'm trying to anticipate what those needs would be before he'd ask."

As for the feedback on the diagram, "I was looking at the communication part, and he was looking from the consistency/control side," she explains. "I think you have to balance both." But, she says, "Karl is open enough to discussion that if I were not fully satisfied, I'd go back and discuss it again."

Suddenly, we're interrupted by Moore's secretary. Moore is due at a meeting. We leave together, but Moore quickly strides ahead, his pace even faster than Greil's.

4:10pm

We stop by the office of Richard Johnson, manager of corporate systems. With Greil, he is writing the work force development direction statement. Greil wants to make sure he includes a section on expanding the IS framework to include a process orientation, which would be blended with the current functional orientation.

"Because of my special assignment, I was not able to promote this concept personally in some of the planning sessions," Greil explains. "A couple of people really didn't understand why I was promoting a process orientation in the IS organizational structure and workflow. Over time, they're going to be seeing the importance of that, especially through the business process redesign work being done."

4:45pm

Greil has had a chance to review the presentation to Liquid Packaging and seems distracted by it.

The project, she says, focused on how IS could help the business achieve its strategic objectives. At the same time, the group was looking at installing an integrated manufacturing system. However, the report focused mainly on recommending a specific piece of software and left out any in-depth discussion of the business processes that needed to be reviewed.

"Our team had not evaluated any system software at all," Greil says. "We were identifying the business need for software of that type. If that got left out, it could have been misinterpreted that we were promoting that software, and it would not have emphasized the business recommendations."

For the first time today, fatigue starts to show on her face and in her manner. She grows quiet and serious as she sees that this presentation has problems.

She makes a call to Russell Johnson, one of the team leaders, who has not yet seen the report. She suggests they meet and talk about it — "just the highlights," she promises.

5:30pm

The hallways are filling with people departing for home as we sit down with Johnson. He appears relaxed but grows more uncomfortable as he pages through the report.

Slowly, he comes to recognize what Greil is saying: The report appears not to do justice to all the work the team has done. But their options are few — the presentation is scheduled for first thing tomorrow morning.

The clock ticks past 6:30. Finally, they work out a way to include recommendations for which business processes to scrutinize. Somehow they'll find time to review these with the team co-leader in the morning. "It's going to be an interesting day," Johnson promises.

Postscript: As it turned out, the day and the weeks that followed proved to be a prologue to an interesting new assignment for Greil.

When her three-month re-engineering project ended, she returned with a new job title — new for her and new for International Paper. In the role of business account manager, she will once again start from scratch to design a new function area within International Paper.

The goal is to work closely with business managers to discover strategic opportunities for IS and help ensure that IS products and services are meeting the customers' needs.

"I've often been involved in start-up operations or organizations," Greil says. "For some people, it's scary, but for me, it's easier because I'm starting from scratch, and there's not a lot of baggage."

In the cards

Staffers in the IS department at International Paper share a commitment to six key goals, outlined on a foldout card that each one carries

1. Support

Creating a climate that is open, honest and respectful.

2. Training

Ensuring that each member has the necessary skills and knowledge.

3. Quality

Providing products and services that exceed customer demands.

4. Innovation

Offering information technology that serves customer goals.

5. Direction

Involving senior management in setting IS strategy.

6. Partnerships

Sharing in the business planning process.

Thriving on change and challenge

Re-engineering has been a big part of Mary Jo Greil's career. After earning a doctorate in MIS from the University of Memphis, she completed her doctoral work by spearheading a re-engineering project at Amca International that focused on streamlining administrative activities.

Greil is also very involved with the Society for Information Management. She founded the Memphis chapter and has worked with the East Coast Working Group since its inception. She is currently a member of the SIM Board of Directors and the SIM Working Group Steering Committee.

She is the managing editor of "Network," SIM's flagship publication. According to SIM, the publication has expanded to include more timely IS business topics, an executive summary, book reviews, a fax feedback column and more coverage of international IS issues.

Greil says that her process-oriented bent comes naturally. From the time she was 11, growing up on her family's farm in Wisconsin, she took it upon herself to chart and schedule the chores for herself and her siblings.

IRony:

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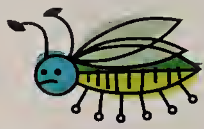
Intelligence Files

FMC Corp. wins award

Waging the war on weeds and pests may have just gotten easier, thanks to the supercomputing efforts of FMC Corp. in Urbana Champaign, Ill.

The company recently received top honors from the National Center for Supercomputing Applications for its use of modeling and simulation technology for research in controlling insects and weeds.

FMC's success with dozens of modeling and simulation projects led to improved products and contributed to the development of new products.



The company produced unique three-dimensional models of an enzyme and a receptor protein, both used to design new compounds for pest control. This enables FMC research and discovery scientists to visualize and test their ideas in simulation before committing the firm's resources, resulting in significant savings.

"We applied high-performance computing to enhance our discovery process. We isolated the building blocks that dictate insect-growth enzymes and receptors, then built three-dimensional models of them. We then were able to test models of new compounds against the target sites to estimate effectiveness," says Dr. Ernie Plummer of FMC's Agricultural Chemical Group at the company's Research and Development Center in Princeton, N.J.

"Being able to visualize this interaction with the target site allows our scientists to use their imaginations and increases the probability of finding new compounds," Plummer says.

"We can actually visualize how a compound interacts with a target site and what changes we can make in order to increase its activity. The electronic images are dynamic models that move like the real world moves and give us a much more accurate view of what we're seeing," he says.

The technology developed by FMC is being used by FMC's Corporate Technology Center in Santa Clara, Calif., and a range of FMC businesses — including agricultural and industrial chemicals, energy equipment, food machinery, airline equipment and defense equipment.

Source: IDG News Service

Top project leaders sought

Information systems executives whose professional management and personal skills exemplify excellence in project management will be honored by the newly created Project Leadership Award Program.

The program was announced at the June 28 Project Leadership Conference in Chicago. Sponsored by Applied Business Technology Corp. in New York, the program will honor five IS project managers selected by a panel of management consultants. The winners will be honored at a special ceremony sometime next spring in New York.

In announcing the new program, Applied Technology's president and chief executive officer Christopher H. Murray said, "Although IS project managers are at the center of the massive change under way in corporate America's information infrastructure, their role is too often unfamiliar, underestimated and underacknowledged by their companies and co-workers.

"The purpose of the Project Leadership Award is to heighten understanding of the project management function and appreciation of those performing it in a special way."

Winners will be selected based on the following factors:

- Leadership effectiveness.
- Resource and vendor management.
- Project planning and control.
- Personal characteristics.
- Contribution toward business goals.
- Success of IS managed projects.

Candidates can be nominated by obtaining a nomination form from Applied Business Technology Project Leadership Award, 361 Broadway, New York, N.Y. 10013, (212) 219-8945 or fax (212) 219-3597.

Source: Applied Business Technology

Renaissance IS leaders

A new program at New York University (NYU) hopes to train the "renaissance men and women of the business world," by combining courses from the information sciences program with the business program.

The new program, the master of science in information systems, is a joint program sponsored by the Courant Institute of Mathematical Sciences and the Stern School of Business at NYU. It will teach students database management, computer algorithms, artificial intelligence and client/server computing, as well as business courses such as accounting, finance, marketing, advanced systems development and technology strategy management.

Edward A. Stohr, chairman of the Stern School's IS department, says the program's goal is to "turn out information systems specialists uniquely qualified to lead forward-thinking companies as they marry new technology with real-world business needs."

Source: New York University

Calendar

Turning knowledge into gold

While many conferences offer information systems executives advice on how to manage information, at least one upcoming conference will provide tips on how to manage knowledge.

The Planning Forum (The International Society for Strategic Management Planning) in Oxford, Ohio, and the Ernst & Young Center for Business Innovation in Boston will cohost "The Knowledge Advantage: Solutions in Practice," on Sept. 26-27 at the Four Seasons Hotel in Boston.

The conference will focus on knowledge as a sustainable, renewable advantage in business competition. It will discuss three vital components of knowledge management: organization, process and behavior. And it will address the following challenges:

- Determining what areas of knowledge to tap and where they may be hidden in the organization.
- Extracting knowledge from sources that cross organizational territories.
- Turning that knowledge into a commodity that can be passed along, augmented and invested.

Speakers will include Chris Bartlett from the Harvard Business School, who will discuss how organizations are being redesigned based on knowledge imperatives; and Joe Pine, known for his writings on "mass customization," who will explain "learning relationships" with customers.

To register for the conference or for more information, contact The Planning Forum, P.O. Box 70, 5500 College Corner Pike, Oxford, Ohio, 45056, (513) 523-4185 or fax (513) 523-7539.

AUG. 7-13

GroupWare '94. San Jose, Calif., Aug. 7-10 — Focus: Emerging technologies fellowship program offers fellowships to emerging groupware companies without the funds to display their groupware products publicly. The fellowship program also fosters publicity, partnerships and contacts for up-and-coming companies. Contact: Bob Bierman, The Conference Group, Scottsdale, Ariz. (602) 661-1260.

Share Summer 1994 Meeting. Boston, Aug. 7-12 — Keynote: Louis V. Gerstner, IBM chairman and CEO. Contact: Share, Inc., Chicago, Ill. (312) 822-0932.

The Asynchronous Transfer Mode (ATM): Foundation for Broadband Networks. Denver, Aug. 8-9. Also being held in Troy, Mich., Oct. 10-11; Philadelphia, Oct. 24-25; and Atlanta, Oct. 26-27 — Contact: Lori Ann Milhaven, International Institute for Learning, Inc., New York, N.Y. (212) 758-0177.

World Developers Conference. Seattle, Aug. 8-10 — Focus: The conference will offer seminars and sessions in the following tracks: authoring techniques, multimedia applications, third-party solutions, computer-based training and database modeling. Keynotes are Paul Allen, chairman and CEO of Asymetrix Corp.; Bert Kolde, president of Asymetrix; Jesse Berst, editor and publisher of "Windows Watcher;" and Rick Segal, director of multimedia development at Microsoft Corp. Contact: Charlotte Moore, International Public Relations Counsel, Bellevue, Wash. (206) 637-5896.

Information Security Managers Symposium XIII. Hilton Head, S.C., Aug. 9-11 — The conference will address security issues such as multiplatform security administration, warning systems, securing the client/server environment and preparing for surviving a disaster. Contact: MIS Training Institute, Framingham, Mass. (508) 879-7999.

Share Technology Exchange. Boston, Aug. 9-11 — Contact: Share, Inc., Chicago, Ill. (312) 822-0932.

Workflow '94. San Jose, Calif., Aug. 10-12 — Workflow technology sessions will include: "Getting Started," "Implementing Now" and "Next Steps." Contact: Bob Bierman, The Conference Group, Scottsdale, Ariz. (602) 661-1260.

The Kerzner Approach to Project Management: A Systems Approach to Planning, Scheduling and Controlling. Troy, Mich., Aug. 12-15 — The event will examine how to get line managers and project managers to work together to bring projects in on time, within budget and free of conflict. Contact: Lori Ann Milhaven, International Institute for Learning, Inc., New York, N.Y. (212) 758-0177.

Re-engineering with Knowledge: Getting the Most Value from Your Most Valuable Asset. Chicago, Aug. 13 — Seminar will highlight the effective dissemination, consolidation and automation of knowledge. Contact: Carnegie Group, Pittsburgh, Pa. (800) 284-3424.

AUG. 14-20

Software Marketing Perspectives '94. San Francisco, Aug. 14-17 — Contact: Stuart Rauch, Kawalek & Associates, San Francisco, Calif. (415) 296-7744.

Computerworld welcomes announcements on seminars and conferences of general interest to our readership and will publish all on a space-available basis. Calendar notices should include the title of the event, dates and location, theme or focus, keynote or major speakers, principal topics and a contact person, organization and phone number. **Send announcements to David Weldon, Associate Editor/Management, Computerworld, 375 Cochituate Road, Framingham, Mass. 01701, fax (508) 875-8931.**

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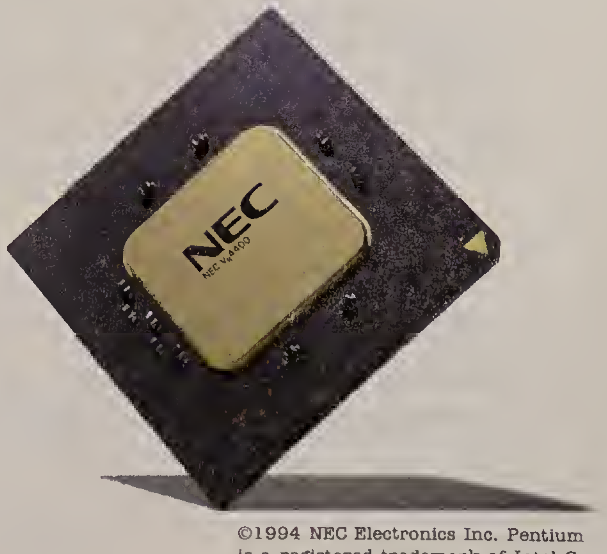

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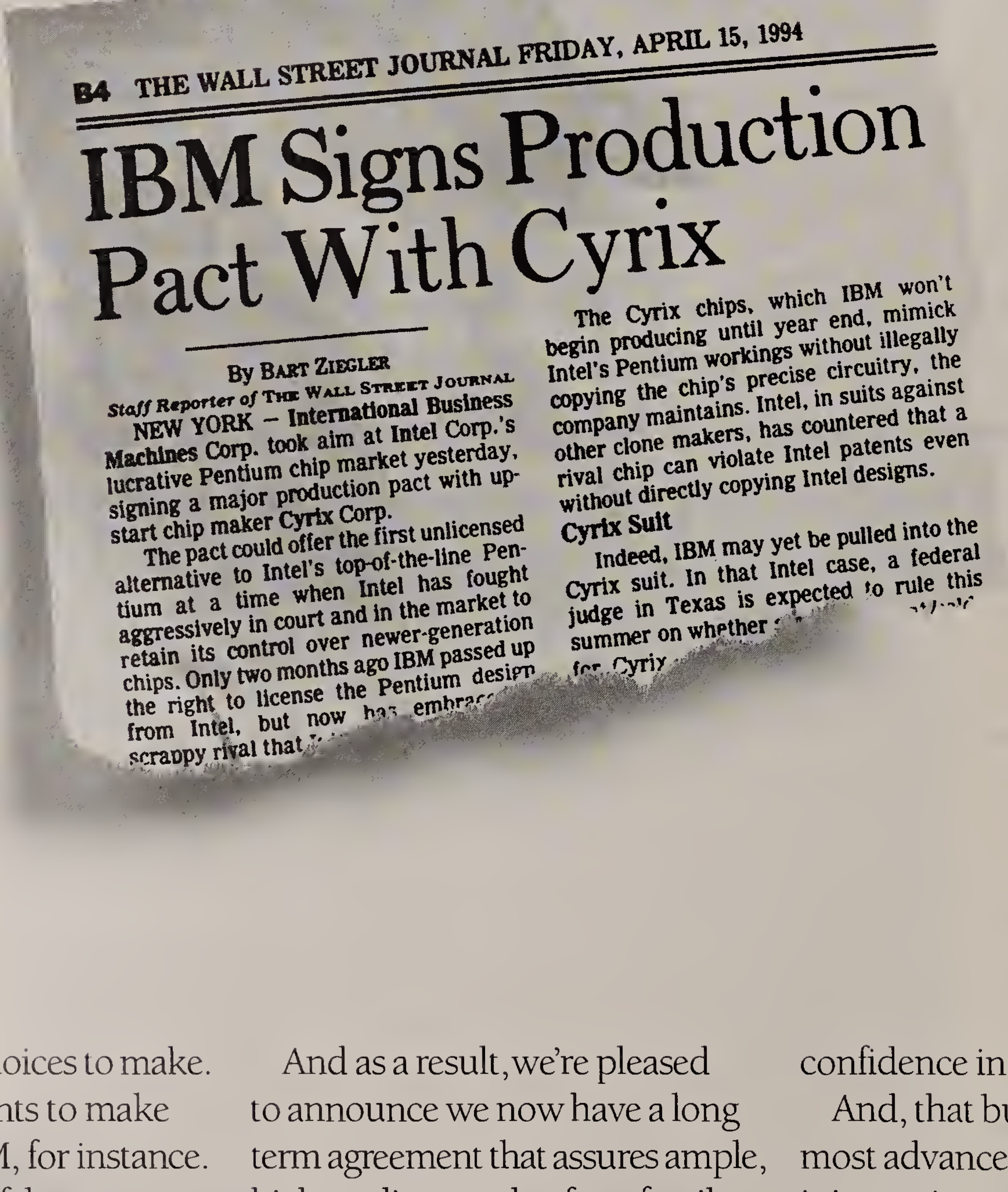

B4 THE WALL STREET JOURNAL FRIDAY, APRIL 15, 1994

IBM Signs Production Pact With Cyrix

By Bart Ziegler
Staff Reporter of The Wall Street Journal

NEW YORK – International Business Machines Corp. took aim at Intel Corp.'s lucrative Pentium chip market yesterday, signing a major production pact with upstart chip maker Cyrix Corp.

The pact could offer the first unlicensed alternative to Intel's top-of-the-line Pentium at a time when Intel has fought aggressively in court and in the market to retain its control over newer-generation chips. Only two months ago IBM passed up the right to license the Pentium design from Intel, but now has embrac scrappy rival that

The Cyrix chips, which IBM won't begin producing until year end, mimick Intel's Pentium workings without illegally copying the chip's precise circuitry, the company maintains. Intel, in suits against other clone makers, has countered that a rival chip can violate Intel patents even without directly copying Intel designs.

Cyrix Suit

Indeed, IBM may yet be pulled into the Cyrix suit. In that Intel case, a federal judge in Texas is expected to rule this summer on whether for Cyrix

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The CW Guide to Client/Server Development Tools

THE WALL

By Judith S. Hurwitz

Troy Thomas

So you've just brought home the latest client/server development tool. For the first time, your users see the functionality and benefits of client/server and the flashy graphical user interface that comes with it. The desktops have become powerful application players. You look like a winner.

But don't count that bonus yet. As users become accustomed to the new applications, they want to add more functionality. They want to track multiple product lines with the order-entry application. They want to access three databases instead of one. They want ad hoc reports for themselves, their managers and other departments.

Your developers use the tool to build enhancements. Instead of 30M bytes of code, there are now 70M to 80M bytes. Your single-tasking, single-threading Windows environment is beginning to bog down with multiple demands. Users need sever-

Information systems organizations reach for more as current tools hit their limit

The wall, *page 92*

Computerworld Buyers' Satisfaction Scorecard

See Scorecard, page: 101

Based on 200-user satisfaction survey

Client-centric graphical tools	Best score	Worst score
MICROSOFT VISUAL BASIC 3.0	PRICE	COMPATIBILITY
GUPTA SQLWINDOWS 4.1	APPLICATION QUALITY	SUPPORT, PRICE
POWERSOFT POWERBUILDER 3.0	EASE OF USE	SUPPORT
Balanced/enterprise tool		
UNIFACE 5.2	COMPATIBILITY	EASE OF USE, PRICE

Firing Line

See Firing Line, page: 94

Based on a scale of 1 to 5, where 5 is best

KnowledgeWare's ObjectView 3.0

4 OVERALL RATING

The January release of Version 3.0 packs more performance and features into the Windows-based tool, but users struggle with its new object and file libraries.

Bachman's Ellipse 5.1

4 OVERALL RATING

Evaluators describe many improvements in Version 5.1 as complete revisions but balk at the interface's lack of customization.

SHOPPING FOR A SPECIALIST

Formulas won't help you decide whether to farm out client/server development projects. Intuition is your best resource. If you hire experts, however, choose carefully.

SEE MARKETPLACE

THE WALL

CONTINUED FROM PAGE 91

al things done at the same time. The scripting language can't deal with the complexity, and the developers resort to using the C language. You add more hardware, more disk, more code.

Suddenly you have duplicate application logic on everybody's system. Performance is dragging. Users are complaining. Your systems are hitting a wall. Business performance and functionality collapse under the pressure.

Welcome to the "fat client syndrome." Fat client syndrome appears when there is so much logic on the desktop that performance suffers. The desktop is bogged down by the additional third-generation language (3GL) code and the complexities of handling I/O between a single-tasking, single-threaded desktop and multiple server data sources. In reaction, users begin to upgrade their desktop systems. If the application is deployed to hundreds or even thousands of users, desktop hardware costs could add up to millions of dollars.

The cure, unfortunately, is to start over again with a tool designed for the application requirements your organization faces. Here is a prescription for which tool type fits which job:

Client-centric graphical tools

When most information technology managers think of client/server tools, they imagine a graphical screen painter. Most of the tools on the market are noteworthy for the way they create data-entry and retrieval screens. These tools tend to implement all of the application logic on the client. If they are Windows-based, they are typically single-tasking and single-threaded. They will be useful if the application is designed to ease user manipulation of data from a server database.

Many of these tool vendors offer well-designed PC-based reporting and query tools that will help make end users more productive. These tools work well in tactical or small departmental/workgroup applications. But for larger projects, the next class of tools is recommended.

Server-based development tools

Another category of client/server development systems has emanated from the server world rather than the client world. Typically, these tools have lacked the ability to produce PC-style graphical desktop screens. However, they have done an excellent job of providing organizations with scalable, server-based development systems. These tools are appropriate when designed for medium-size workgroups of about 500 users. Many of these tools have recently undergone redevelopment to improve their ability to provide graphical clients.

CLIENT-CENTRIC	
Blythe Software, Inc. Foster City, Calif. (800) 346-6647	**Omnis**
Gupta Corp. Menlo Park, Calif. (800) 876-3267	**SQLWindows**
KnowledgeWare, Inc. Atlanta, Ga. (800) 444-8575	**ObjectView**
Microsoft Corp. Redmond, Wash. (800) 426-9400	**Visual Basic**
Powersoft Corp. Burlington, Mass. (800) 273-2841	**PowerBuilder**
SERVER-BASED TOOLS	
Information Builders, Inc. New York, N.Y. (800) 969-4636	**Focus**
KnowledgeWare, Inc. Atlanta, Ga. (800) 444-8575	**ADW**
Oracle Corp. Redwood Shores, Calif. (800) 672-2531	**CDE**
Progress Software, Inc. Bedford, Mass. (800) 327-8445	**Progress**
Ross Systems, Inc. Redwood City, Calif. (415) 593-2500	**GEMBASE**
Seer Technologies, Inc. Cary, N.C. (919) 380-5000	**Seer•HPS**
Texas Instruments, Inc. Plano, Texas (800) 336-5236	**IEF for Client/server**
BALANCED TOOLS	
Bachman Information Systems, Inc. Burlington, Mass. (800) 222-4626	**Ellipse**
Dynasty Software, Inc. Laguna Hills, Calif. (800) 453-6142	**Dynasty**
Forte Software, Inc. Oakland, Calif. (510) 869-3400	**Forte**
Informix Software, Inc. Menlo Park, Calif. (800) 331-1763	**Informix NewEra**
Intersolv, Inc. Rockville, Md. (800) 547-4000	**APS**
JYACC, Inc. New York, N.Y. (800) 458-3313	**JAM6**
Neuron Data, Inc. Palo Alto, Calif. (800) 876-4900	**CS/Elements**
Lotus Development Corp. Cambridge, Mass. (800) 343-5414	**Notes**
Uniface Corp. Alameda, Calif. (800) 365-3608	**Uniface**
Unify Corp. Sacramento, Calif. (916) 928-6400	**Vision**
OBJECT-ORIENTED	
Digitalk, Inc. Santa Ana, Calif. (800) 531-2344	**Smalltalk/V**
Easel Corp. Burlington, Mass. (800) 525-1411	**Synchrony**
IBM Armonk, N.Y. (800) 426-3333	**VisualAge**
ParcPlace Systems, Inc. Sunnyvale, Calif. (800) 759-7272	**Visualworks**
Taligent, Inc. Cupertino, Calif. (408) 255-2525	**Framework**
Trinzic Corp. Portsmouth, N.H. (800) 952-8779	**Objectpro**

Balanced client/server systems

The newest generation of tools tries to provide the best of both worlds: a graphical client development environment and the ability to move application logic and data to the most appropriate platform — a feature known as partitioning.

Tools in this category are most appropriate for building high-end enterprise-enabled systems supporting thousands of users. These tools also tend to provide the best characteristics of structured computer-aided software engineering (CASE) tools as well as sophisticated development languages so developers do not have to work with 3GLs. Therefore, these tools provide built-in data dictionaries and repositories to store business rules, diagramming tools and the like. Many also have published application programming interfaces so third-party tools can be integrated.

Many tools from the server-based segment are evolving at a rapid pace and will begin to fit into this category.

Other players come from the object-oriented and CASE arenas.

The tools and technology to build client/server systems continue to improve in sophistication and capability. More will offer transaction management as a natural outgrowth of a technology based on thousands of clients triggering millions of transactions any time, any place.

The evolution of the client/server tools market is still at an early stage, so management should select tools cautiously. Tools you select today may be different from the ones you'll need in three to five years. Keep this in mind when you build your first client/server applications.

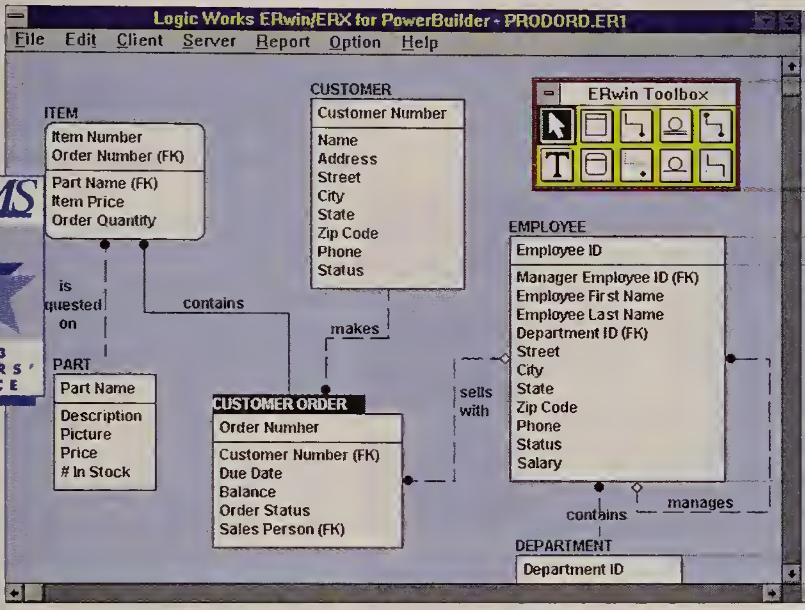
The next generation of client/server tools will be based increasingly on object-oriented principles, which will help provide more flexibility and modularity to support the creation of applications from reusable components.

Always keep an open mind. Don't look for a single tool to solve all development problems throughout your organization. Work with several different tools. Always have new tools in a laboratory so you'll be prepared for the inevitable technological changes.

Details on the ranges of application development projects are on page 99. ■

Hurwitz is president of Hurwitz Consulting Group, Inc. in Watertown, Mass. Her Internet address is JHurwitz@world.std.com.

Introducing the Client/Server Dream Team.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ERwin Toolbox
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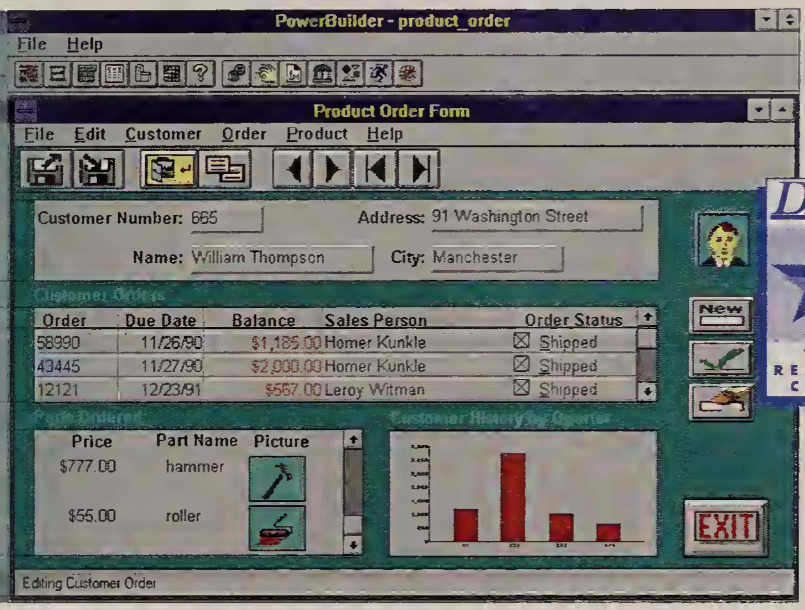
PowerBuilder - product_order
File Help
Product Order Form
File Edit Customer Order Product Help
New
EXIT

Customer Number: 665
Address: 91 Washington Street
Name: William Thompson
City: Manchester

Order	Due Date	Balance	Sales Person	Order Status
58990	11/26/90	$1,185.00	Homer Kunkle	☒ Shipped
43445	11/27/90	$2,000.00	Homer Kunkle	☒ Shipped
12121	12/23/91	$567.00	Leroy Witman	☒ Shipped

Price	Part Name	Picture
$777.00	hammer	
$55.00	roller	

Editing Customer Order

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ER*win* has set the standard for making database design easier. Point-and-click and you capture business rules and define your data in an ER diagram. And a seamless link to your database catalog makes Forward and Reverse-Engineering (Server FRE) fast and easy.

PowerBuilder is the most powerful Windows application development environment available today. Industrial-strength, object-oriented applications are built in an easy-to-use point-and-click environment. And robust database support lets you seamlessly access the most popular server and desktop databases.

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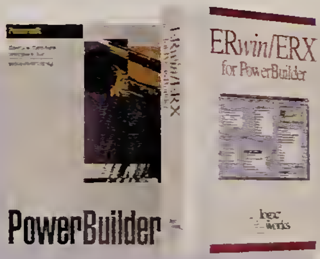
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MICROSOFT WINDOWS

OBJECTVIEW 3.0: Fast and flexible but lacking consistency

ObjectView

- ObjectView's users cited its speed and flexibility as strong points.
- But they said the new version's object and file libraries lacked the solid performance of the core product.

KnowledgeWare, Inc.'s latest release of ObjectView 3.0, announced in January, provides improved performance and new reporting tools. It also comes with object and file libraries.

Users who evaluated the product said they like its basic components — particularly the editor and compiler — because of the speed and flexibility they provide for different environments. But users said they were more cautious about using the new libraries because of performance and usability issues.

EASE OF INSTALLATION

The merging of product modules bogged down installation for the evaluators.

Manufacturer 2: "There is an overall problem in the way they released 3.0 and then rereleased it with additional products. There was confusion about what was part of the package."

Manufacturer 3: "Version 3.02 gets a low rating. The next release was better. After they started shipping Clear Access with ObjectView, they didn't do a very good job of packaging all the products in properly."

USER INTERFACE

Different version and module issues also affected ease of use.

Manufacturer 1: "The interface is a little bit inconsistent. The jump from 2.1 to 3.0 switched color palettes and dialogues. They attributed it to a move to Unix."

Site profiles

	Manufacturer 1	Manufacturer 2	Manufacturer 3
TIME IN USE	Three years	Three years	Three years
VERSION	2.1 & 3.0	2.11 & 3.0	2.0 & 3.0
APPLICATIONS DEVELOPED	50 all types	1 logistics	1 oil & gas
OPERATING SYSTEM	Windows 3.1	Windows 3.1	Windows 3.1
DATABASE	Oracle, Sybase, Teradata	Oracle, Sybase DB2, Teradata	Microsoft SQL Server
REASON FOR USING OBJECTVIEW	Support for Sybase	Open database support	Execution speed & SQL Server support

BACHMAN ELLIPSE: Built for transaction-intensive applications

Bachman Ellipse

- Ellipse received high ratings for the quality of applications produced, ease of installation and programming speed.
- Evaluators said they were impressed with Bachman's service improvements since acquiring the product from Cooperative Solutions, Inc. last year.

Bachman Information Systems, Inc.'s Windows version of Ellipse has brought friendlier functionality to the high-end client/server development environment.

Ellipse's strength has been in on-line transaction processing (OLTP). Evaluators said they chose Ellipse because of its approach to the repository. "Bachman understands what transaction processing is all about," one evaluator said.

EASE OF INSTALLATION

Users gave high scores for the improvements made to a once far from intuitive process.

Communications: "It's a real smooth installation. Just put the CD-ROM into the reader and answer the questions through the process. Previous versions required much more effort."

Systems integrator: "Earlier versions had a much more involved process. The beta is far improved."

USER INTERFACE

Ellipse's new Windows interface exceed-

Site profiles

	Communications	Satellite communications	Systems integrator	Manufacturer
TIME IN USE	18 months	18 months	18 months	Three years
VERSION	5.1 beta	5.1	1.5 + 1.8	1.5
APPLICATIONS DEVELOPED	Financial, order entry, decision support	Inventory management, sales, product services	Welfare, order entry	Financial, order entry
OPERATING SYSTEM	Solaris	OS/2	OS/2, LAN Manager	OS/2
HARDWARE	Sun SPARCcenter 2000	486-based PCs	486-based PCs	Parallan server
REASON FOR USING OBJECTVIEW	Transaction processing	OLTP	OLTP	OLTP

PROGRAMMING SPEED

Application development was quick, even for new users.

Manufacturer 2: "A lot of my staff are right out of college, and we find it very productive for them to get going."

PROGRAMMING LANGUAGE

Evaluators said they found performance even better in the new version.

Manufacturer 1: "They added extra commands that are very powerful. It's very easy to use as well. We've had a lot of success jumping right into the code and making changes, recompiling and redistributing the applications."

QUALITY OF APPLICATIONS

Manufacturer 2: "We have had problems in the past moving from one version to another, and with 3.0 we're taking a more cautious approach. One of the things I find lacking is to hear from the vendor what bugs have been fixed in the new version."

SPEED OF APPLICATIONS

Manufacturer 1: "The performance is excellent. It's one of the big pushes for this product."

Manufacturer 3: "It's faster than all the other competitors right now."

DOCUMENTATION

Evaluators said the on-line documentation was much better than volumes of paper.

Manufacturer 2: "It keeps changing in format, but the content doesn't seem to change. It lacks depth."

Manufacturer 3: "With 3.02, we've got more paper. I always find the on-line help is the most useful. It's usually more updated."

SERVICE

Service and support was fast, but a higher quality initial response was missing.

Manufacturer 1: "It meets our expectations, but the callback isn't always very helpful. The follow-up has been lacking after the initial call."

Manufacturer 2: "Support is good. But we're not sure what they do with the bugs we report."

COMPATIBILITY WITH METHODOLOGY

Manufacturer 1: "It's always worked on Windows 3.1. We're concerned about the future, but KnowledgeWare says it is heading where we want to go."

Manufacturer 2: "We have a rapid application development methodology that ObjectView fits right in with in terms of the ease and speed of development."

MULTIPLE OPERATING ENVIRONMENTS

Manufacturer 1: "We use several databases, and KnowledgeWare has always been cooperative with Sybase. They had to work out some kinks with Oracle's stored procedures. There's a performance boost with Teradata."

Manufacturer 3: "We have Oracle and SQL Server, and there have been no problems."

NEW FEATURES

Manufacturer 1: "Least useful were the object library and file library. The object library is too cumbersome and too hard to use. It's real slow. Reusability is great, but it depends on the application."

Manufacturer 2: "We're looking forward to the object library in concept to standardize and reuse code. The base product is our bread and butter. We hope they don't forget about it. The file library is not of the caliber we need." ■

Compiled by senior editor Michael Sullivan-Trainor.

KnowledgeWare's ObjectView 3.0

KnowledgeWare, Inc., Altanta,Ga. (404) 231-8575

RATINGS ARE BASED ON USER EXPECTATIONS ON A 1-TO-5 SCALE, WHERE 1 IS BELOW EXPECTATIONS AND 5 IS ABOVE EXPECTATIONS.

4	**OVERALL RATING**
4	QUALITY OF APPLICATIONS
4	COMPATIBILITY WITH METHODOLOGY
5	SPEED OF APPLICATIONS
4	PROGRAMMING LANGUAGE
3	USER INTERFACE
4	SERVICE
3	DOCUMENTATION
4	PROGRAMMING SPEED
3	SUPPORT FOR MULTIPLE OPERATING ENVIRONMENTS
3	EASE OF INSTALLATION

---

ed evaluators' expectations, but the ability to customize remains a desired benefit.

Communications: "It does not have any custom controls in it right now. That would be a nice feature for [Bachman] to add."

EASE OF PROGRAMMING

Users said producing applications under the new beta version was easier and quicker than with older versions.

Communications: "Development is quicker. Some processes are three to four times faster."

Systems integrator: "Its head start utility allows you to build data-entry screens, which gives you delete, add and update functionality right away. What is left is just customization, which has allowed us to build our functions very quickly."

PROGRAMMING LANGUAGE

Although Ellipse's Data Manipulation Language (DML) is characterized as a fully featured language, evaluators said certain functions can only be accomplished through external programming. But while DML restricts a developer's flexibility within OLTP requirements, it also assures that all coding will adhere to standards. Users describe the shortfall as a blessing and a curse.

Systems integrator: "It's wonderful that it will generate stored procedures for you, but it doesn't allow you to access your own stored procedures. This makes it difficult to make changes if you try to distribute the application across a wide area."

Satellite communications: "We have been able to access our stored procedures, but we had to do it through an external call."

SPEED OF APPLICATIONS

One evaluator was in the process of testing its two beta-version-produced applications and had some initial speed and efficiency concerns stemming from the 250 users eventually planned for the system.

Satellite communications: "We developed a complete administrative system and are now performing a series of simulations. So far, it has met every stress test."

SUPPORT AND DOCUMENTATION

The new documentation did an about-face from the older 1.5 manuals.

Communications: "It's been totally revised. It's organized better and now includes a concept manual that helps you with your approach when structuring an application."

Satellite communications: "One of the biggest problems we had was pre-Bachman. The support of Cooperative Solutions was not very good. Bachman has really turned it around."

NEW FEATURES

The Multiple Document Interface (MDI) module was viewed as one of the best new features. It provided developers with a more fluid communication mechanism between panels.

Satellite communications: "In our existing projects we had to work around the fact that we had to shut one window to go to another. With the MDI, multiple windows can stay open."

Communications: "They added a very easy-to-use delete function that allows the deletion of objects in libraries. It was very painful in older versions." ■

Compiled by senior researcher Kevin Burden.

Bachman's Ellipse

Bachman Information Systems, Inc.,
Burlington, Mass. (617) 273-9003

RATINGS ARE BASED ON USER EXPECTATIONS ON A 1-TO-5 SCALE, WHERE 1 IS BELOW EXPECTATIONS AND 5 IS ABOVE EXPECTATIONS.

4	**OVERALL RATING**
4	QUALITY OF APPLICATIONS
4	COMPATIBILITY WITH METHODOLOGY
4	SPEED OF APPLICATIONS
4	PROGRAMMING LANGUAGE
4	USER INTERFACE
4	SERVICE
4	DOCUMENTATION
4	PROGRAMMING SPEED
3	SUPPORT FOR MULTIPLE OPERATING ENVIRONMENTS
4	EASE OF INSTALLATION

Bruce Harreld
Computerworld Reader
Since 1985
President, Boston Chicken

BOSTON
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CHICKEN

In the information market, this much is clear: Vendors make the products. IS managers make the decisions.

As problems go, the one facing Boston Chicken was the kind we'd all like to have: they were growing too darn fast. So much so that their field offices were having trouble keeping up-to-date with their support center. After much burning of the midnight oil, they realized they needed a simple, effective software package to both keep track of and plan their meteoric rise. One thing was clear—they were at a definite crossroads.

After an intense period of searching and evaluation, Lotus Notes came to roost. Now the folks at Boston Chicken can access, track, share and organize business information in ways they never thought possible. In fact, it's worked out so well, Boston Chicken plans to implement the market-leading Notes in some 30 field offices before the end of the year. So now you not only know why the chicken crossed the road. You also know how.

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Vendors to address evaluators' concerns

ObjectView will be better integrated; Ellipse language to support stored procedures

KNOWLEDGEWARE RESPONDS

New features

- Module integration will be incorporated into the next release of ObjectView, which is targeted for release in the late fall. Also, a new user interface will more closely adhere to Windows standards.
- The object library will be rearchitected with the next release of ObjectView to provide speed, ease-of-use and additional functionality, including inheritance. The file library was designed for entry-level version control. For enterprisewide use, we recommend using InterSolv Inc.'s PVCS, which is tightly integrated with ObjectView 3.0

Quality of applications

In response to users having trouble finding out about the resolution of bugs, we are now developing a process to provide a feedback loop to notify customers of specific fixes and their associated release levels.

Documentation

The "Command Reference Manual," which has received high marks from experienced ObjectView users, will continue to be improved to meet high standards. We will also completely revise the "Developer's Guide" and "Getting Started" manuals for the next release.

Support for multiple operating environments

We are actively pursuing ObjectView multiplatform support. In addition to Unix, 32-bit Chicago and Macintosh versions are planned for future release.

BACHMAN RESPONDS

User interface

In Ellipse's next release, Bachman plans to provide users with more customization capabilities for the user interface. We also plan to support Object Linking and Embedding 2.0 in a following release.

Programming language

Bachman is aware of the limitations that evaluators noted in the DML programming language, and the next release of Ellipse will provide additional functions that our users requested. In addition, we will provide a direct mechanism for calling stored procedures coded in the SQL dialect of the target database management system.

Compatibility

Bachman plans to support Chicago and Windows NT as both client and application server platforms for Ellipse within the next 12 months. Users will not need to change their Ellipse applications to take advantage of these new platforms.

A MESSAGE ON THE RISK OF MOVING TO CLIENT/
BROUGHT TO YOU BY THE O

Some businesses are choosing a perilous route to client/server technology. By partnering with companies that don't offer all the tools necessary to make this transition, they risk making a huge investment that fails to take them where they need to go.

Fortunately, there is one software company that can safely guide you through the migration to client/server: Cognos®.

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We also offer Impromptu® and PowerPlay®, our Windows-based data

Fitting the tool to the job

Here's a framework for your client/server application levels

By Judith S. Hurwitz

In this early stage in the evolution of client/server computing, the market is bustling with new entries. Information technology managers are being bombarded with advertisements, literature and marketing seminars. The need to migrate to new tools is urgent at organizations strapped with aging systems no longer able to meet rapidly changing business requirements. But what tool is appropriate?

When our organization is asked this question, we immediately change the focus from what tool should be used to what business problem must be solved.

Despite the confusion created by so much technology from so many vendors, business objectives can be matched with available products. This is the best approach to take when planning a strategy to migrate to client/server.

Analyzing business objectives

When analyzing technology solutions, first decide what problem needs to be solved. We have identified three models based on an organization's specific objectives: tactical, departmental/workgroup strategic and enterprise strategic.

1 Tactical objectives

In many situations, organizations need a system to reach a short-term objective. A firm may want to pilot test a new product's impact on the market before introducing it. It will need a system to capture and analyze the information. In a case where a product is designed to be on the market for only a short time, a system must be built quickly and then disposed of. Tactical systems can be built with low-end client/server tools such as the client-centric ones mentioned on page 92. These applications typically service fewer than 10 users and are designed by one or two developers.

2 Departmental/workgroup strategic

Strategic systems come in many shapes and sizes. A system does not have to be strategic to the entire enterprise to be critical. Many departmental systems are more strategic to business objectives than some enterprise-wide applications.

Departmental/workgroup applications come in two varieties: data-driven or conversationally driven. Data-driven applications are designed to access key databases on a server. Conversationally driven applications access more subjective data from a variety of sources.

Data-driven applications development tools is one of the most popular segments of the tools market to date. Examples of conversationally driven tools include Lotus Development Corp.'s Notes and mail-enabled applications.

In the coming years, more and more tools will flourish in this space. Departmental/workgroup strategic applications are typically designed for three to five developers and support as many as 100 users.

3 Enterprise strategic

This is largely uncharted water for client/server systems. This part of the market will be dominated by a class of application development tools that can scale to replace aging mainframe applications.

Three types of tools will be important here: client/server vertical software aimed at solving specific missions (accounting, manufacturing, financial and human resources); tools tied to relational database management systems; and high-end tools designed to build database-independent, large-scale systems from scratch. In each case, these systems are designed to support as many as 100 developers and thousands of users.

Once you decide if your systems are tactical or strategic, take a look at more granular issues. These technical issues include the role of graphical presentation services; development and deployment of complex logic; the role of server-based development; and the evolution to balanced client/server computing. ■

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analysis and reporting tools that empower everyone in your organization by helping them retrieve and analyze the information they need to make informed business decisions. And besides supporting one another, these tools also support leading databases like ORACLE, Sybase, and InterBase.

When it comes to client/server technology, it's not simply a question of crossing that bridge when you come to it. It's a question of finding a strong, stable bridge. Cognos.

For more information or a free copy of our extensive white paper, "Building and Deploying Applications in the '90s," call **1-800-223-2321, ext. 6302.** In Canada, call **1-800-361-3163.**

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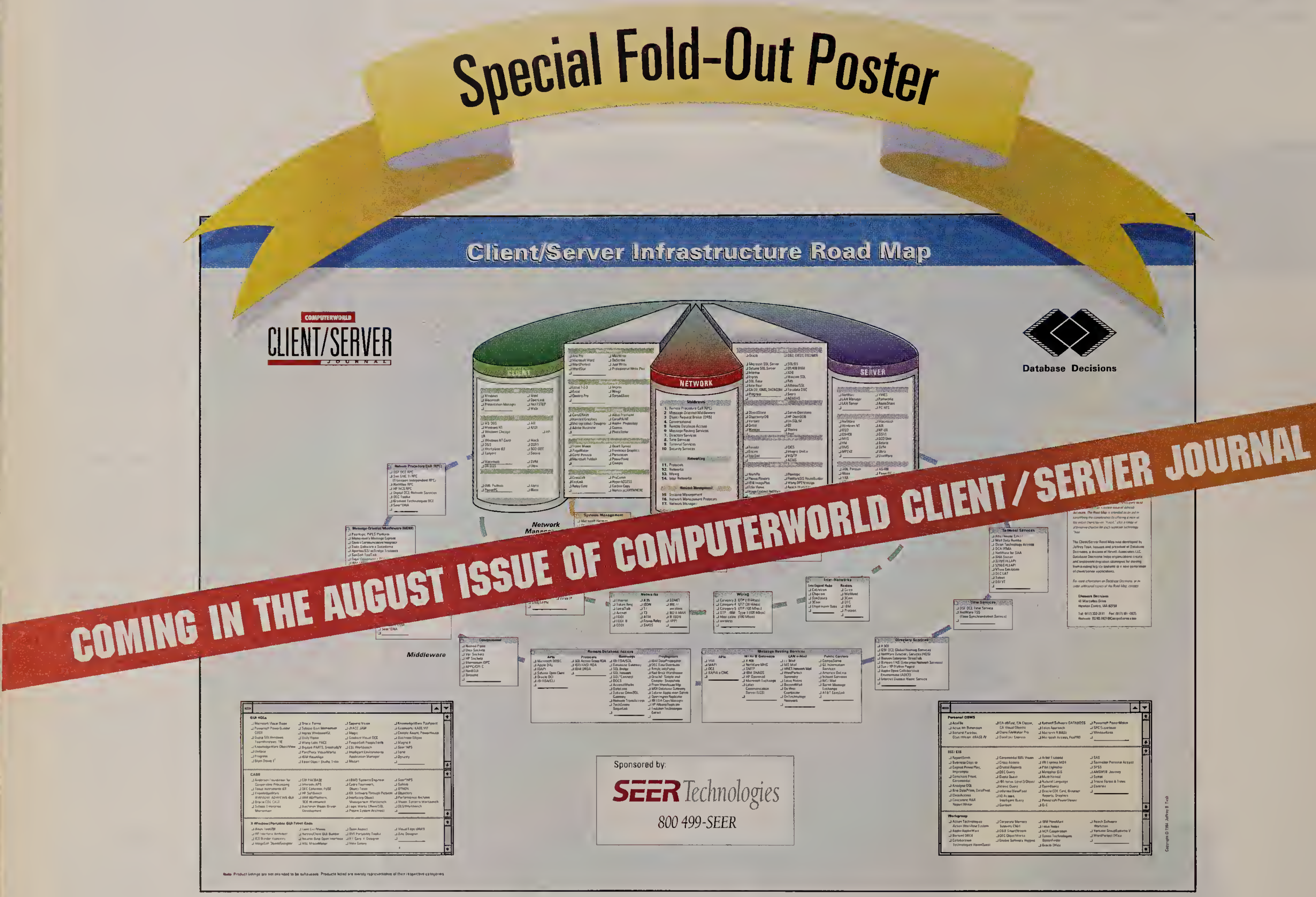
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This special poster details the various hardware, software and networking platforms and products involved in a client/server infrastructure. The Road Map can be your quick reference resource as you navigate through the client/server decision process. Be sure to look for it in the August issue of Computerworld Client/Server Journal, the quarterly magazine for those leading the move to client/server computing.

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80. Information Centers/Libraries, Educators, Journalists, Students
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3 Do you use, evaluate, specify, recommend, purchase: (Circle all that apply)

Operating Systems
- (a) Solaris
- (b) Netware
- (c) OS/2
- (d) Unix
- (e) Mac OS
- (f) Windows NT
- (g) Windows
- (h) NeXTstep

App. Development Products ☐ Yes ☐ No

Networking Products ☐ Yes ☐ No

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Networking Products ☐ Yes ☐ No

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COMPUTERWORLD BUYERS' SATISFACTION SCORECARD

Buyers' Scorecard: Microsoft Visual Basic's application quality wins users over

Satisfaction ratings for client-centric graphical tools

MICROSOFT VISUAL BASIC 3.0

1st — Visual Basic's high scores in ease of use and programming stem from the accessibility of its interface.

GUPTA SQLWINDOWS 4.1

2nd — Top ratings in application quality and programming keep SQLWindows near the top.

POWERSOFT POWERBUILDER 3.0

3rd — Powersoft users cited support as the area most in need of improvement.

USERS RATED PRODUCTS ON 18 CATEGORIES. OVERALL RANKS ARE BASED ON THE AVERAGE RATING WEIGHTED BY THE RELATIVE IMPORTANCE OF EACH CATEGORY.

The lineup

RATINGS ARE BASED ON A 1-TO-10 SCALE, WHERE 10 IS BEST
BASE: 50 USERS PER PRODUCT

	Client-centric graphical tools			Balanced/ enterprise tool
Rating categories	MICROSOFT VISUAL BASIC 3.0	GUPTA SQL WINDOWS VERSION 4.1	POWERSOFT POWERBUILDER 3.0	UNIFACE VERSION 5.2
APPLICATIONS QUALITY	7.7	7.3	6.9	7.2
SUPPORT	6.9	6.6	6.0	7.1
PROGRAMMING	7.6	7.1	6.8	7.0
COMPATIBILITY	6.8	6.9	6.6	7.6
EASE OF USE	7.5	6.9	6.9	6.3
PRICE	7.9	6.6	6.4	6.3

By Kevin Burden

Companies that already have client/server applications up and running are surely a lot wiser about the technology and probably a little bruised from the development process. The best advice any experienced client/server developer can give is start small and make sure the chosen development tool is appropriate for the planned application. This Buyers' Satisfaction Scorecard spotlights the views of 200 users of three client-centric tools and one balanced/enterprise tool. (See category descriptions, page 92.)

Microsoft Corp.'s ubiquitous Visual Basic topped the user satisfaction ratings. Visual Basic posted the highest scores in many of the evaluation categories. It scored notably well in quality of applications produced, accessibility of its interface and value for the dollar. Characterized as a client-centric graphical tool, Visual Basic's development environment is also strengthened by support from dozens of third-party tools.

Gupta Corp.'s SQLWindows, as the name indicates, leverages full SQL capabilities, an important feature for development tools typically camped on PCs that require access to distributed data. SQLWindows received competitive marks for the robustness of its programming language and the quality of applications produced.

Having a user base grow faster than expected was a win/lose situation for Powersoft Corp. last year. It bolstered market share, but growth surpassed the company's ability to effectively support PowerBuilder. Although it has greatly improved its customer support during the past year, Powersoft still scored below the other companies in its responsiveness of service.

PowerBuilder scored the lowest rating in the category of quality of applications produced, the area most important to users.

PowerBuilder has been plagued with scalability problems. While applications with simple data structures performed well, large-scale, high-transaction projects bogged down.

This problem could be somewhat alleviated with Powersoft's current link to Transarc Corp.'s Encina and planned links to AT&T Corp.'s Top End and Novell, Inc.'s Tuxedo transaction-processing monitors.

Unlike the other tools featured in this Scorecard, Uniface's namesake is geared toward developing large transaction-intensive, enterprisewide projects. The major improvements to the newest version, Uniface 6.0, which will be in general availability at the end of this week, will be in the product's kernel. Version 6.0 will have additional partitioning capabilities, and its better use of system services should alleviate the stress on a company's current network.

New features will include a graphical form painter and applications model editor; more central control of objects through the applications objects repository; and improved transaction-processing support through a distributed computing manager.

Uniface achieved the highest rating for its support, and users can expect to see further improvements in its service area as a result of its merger with Compuware Corp. last May. Uniface has trained 200 members of Compuware's 1,600-person support staff and expects to double that total by year's end.

For further information about this survey, contact Michael Sullivan-Trainor or Kevin Burden at Computerworld, *(800) 343-6474.* ■

Burden is *Computerworld*'s senior researcher.

What's important in a client/server development tool?

RANKING IS BASED ON RATINGS OF IMPORTANCE BY 200 USERS SURVEYED

1	APPLICATIONS QUALITY	• Quality of applications • Speed and efficiency of applications • Consistency of applications
2	SUPPORT	• Quality of vendor's support • Responsiveness of vendor's service
3	PROGRAMMING	• Ease of programming • Robustness of programming language • Flexibility of programming language • Speed of programming
4	COMPATIBILITY	• Compatibility with operating environment • Compatibility with development methodology • Working with multiple operating environments
5	EASE OF USE	• Accessibility of user interface • Learning/training time • Ease of installation • Documentation
6	PRICE	• Acquisition and support costs • Value for the dollar

Allen Barnard
Computerworld Reader
Since 1990
Strategic Support Unit Director
EDS Corporation

In the information market, this much is clear: Vendors make the products. IS managers make the decisions.

The EDS corporation, working for the World Cup soccer organization, had an enormous task ahead of them. They needed to quickly design an information system to supply coverage and scores to the fans of what is arguably the world's most popular sport. In addition, their broadcast communications center would be home for 3,500 visiting broadcasters for almost two months. And although the time was tight, there was the additional pressure of knowing soccer fans do not take errors lightly.

In overtime, the save came from Cisco Systems. Cisco routers, combined with the expertise of EDS, provided the perfect way to deal with the mind boggling array of information needs presented by World Cup soccer. The Cisco routers offer impressive flexibility, so any number of protocols and interfaces can be used. In particular, Cisco's switched link activation handles overflow traffic when dedicated circuits overload—crucial for when the action heats up. After all, soccer journalists aren't known to suffer fools gladly, either.

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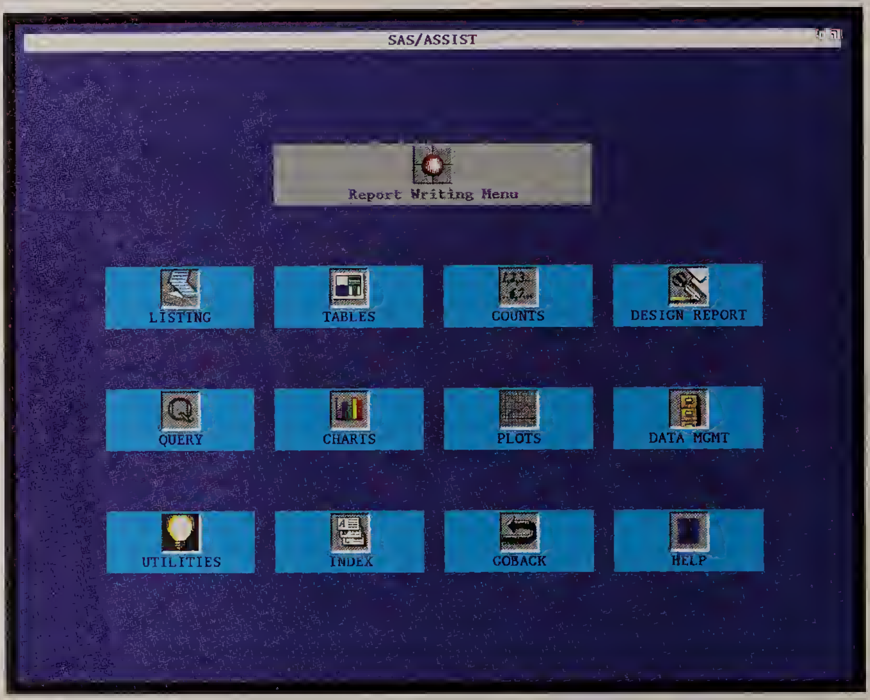
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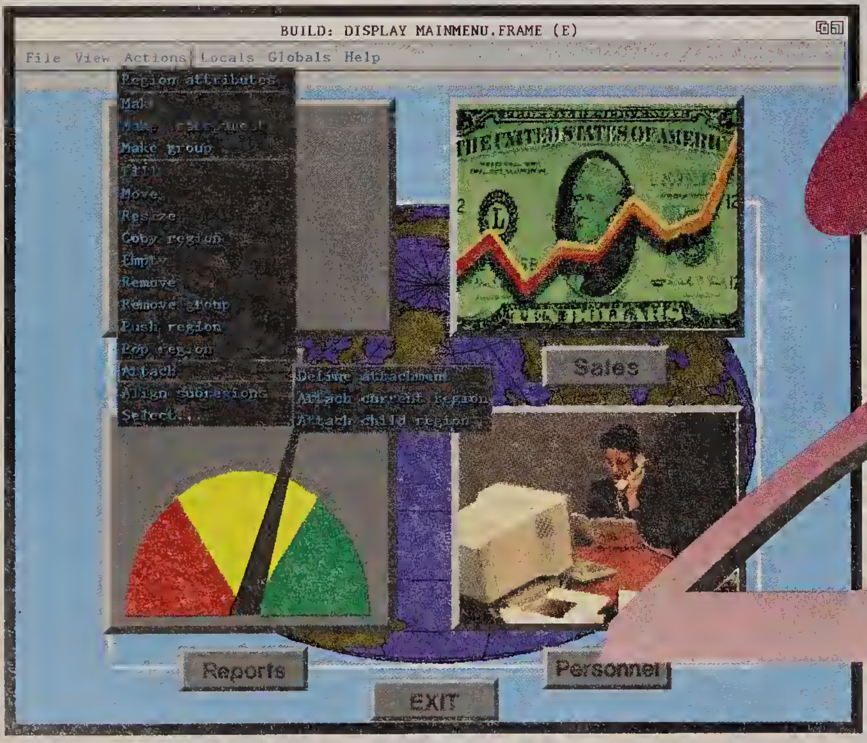
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CLIPPER CONTROVERSY

Jeffery Newbury

DOROTHY DENNING: *Don't believe the anti-Clipper propaganda*

Key escrow scheme protects personal, national security

BY DOROTHY E. DENNING

By scrambling phone conversations into gibberish, the Clipper chip offers vastly improved communications privacy and security.

But you'd never guess that from some accounts.

Conjuring up images of an Orwellian world, Clipper's enemies portray it as a tool for mass surveillance that will cripple privacy in advance of due process. According to its opponents, the chip will enable the government to disregard court orders and tap into phone calls or computer communications at will, all with a few keystrokes.

Denning is professor of computer science at Georgetown University and author of *Cryptography and Data Security*. She is one of the outside reviewers of the classified Clipper technology and its key escrow system.

Pro Clipper, *page 106*

SOUND OFF!

AT ISSUE: On Feb. 4, the White House announced its approval of the Clipper chip cryptography standard under which the government would hold in escrow an overriding digital 'key' it could use to decipher encrypted messages with a court-approved wiretap. To some, Clipper is a way to protect personal and corporate privacy. To others, it's a tool for Big Brother oversight.

Katherine Lambert

DANIEL WEITZNER: *Don't trust the government with your privacy*

Clipper poses 'grave threat' to civil liberties, privacy

BY DANIEL J. WEITZNER

In an effort to balance outmoded national security interests and meet very real needs for data privacy in the future, the Clinton administration has produced a public policy kludge that manages to jeopardize privacy, stifle American innovation and threaten our international competitiveness.

Since its announcement more than a year ago, the Clipper proposal has drawn bitter criticism from privacy advocates and industry leaders alike.

If this administration is serious about making the national (and international) information infrastructure into a vital part of our economy and our democracy, it must go back to the drawing board

Weitzner is deputy policy director at the Electronic Frontier Foundation in Washington.

Con Clipper, *page 106*

pro CLIPPER

JEFFERY NEWBURY

CONTINUED FROM PAGE 105

This anti-Clipper propaganda has nothing to do with reality. The truth is, Clipper will not make it legally or technically easier for the government to tap calls. It will make it much harder.

First off, to implement a wiretap, law enforcement officials must still get a court order in accordance with federal and state statutes. There must be probable cause of criminal activity and a compelling case for why other investigative methods are insufficient. Once the wiretap is installed, the government has to follow strict procedures to minimize the interception of conversations unrelated to the specified offenses.

Second, government officials must still go to the phone company to get the wiretap order implemented, and they won't know until after the wiretap is installed if the communications are even encrypted. At that point, the officials must use a slew of sophisticated equipment, including a special decrypt processor, to determine if the communications are encrypted with a Clipper chip and to extract the chip's unique identifier (UID) from an encrypted block transmitted with the communications.

Government officials must then present the UID, along with certification of legal authority to wiretap, to two escrow agents, each of whom holds a component of a key that unlocks communications encrypted with that particular chip. Only after the escrow officers load these components into the decrypt processor can the government decode the communications.

Third, Clipper's key escrow system has extensive safeguards to protect against misuse of keys. For example, the system uses two-person control for all operations that involve key escrow data. It takes two people at each escrow agent to open the safe containing that agent's key components and one person from each escrow agent to put the components together.

It's hard to image bribing four people without landing in jail.

Another safeguard is auditing. By examining detailed audit records, it will be possible to determine if keys are used only as authorized and to decrypt only communications intercepted during authorized surveillance.

> 'Clipper protects us from spies who want our secrets and from criminals who might evade law enforcement.'

DOROTHY DENNING

In addition to Clipper's safeguards, federal wiretap laws (Title III in 1968 and the Foreign Intelligence Surveillance Act [FISA] in 1978), government regulations and procedures as well as congressional oversight committees help protect against illegal wiretaps and abuse of legal authority. In the past decade or so, the evidence shows that wiretaps have been used judiciously, with about 800 to 900 Title III orders per year and another 500 under FISA. I know of no evidence of widespread abuse of wiretaps by law enforcement officials.

The same evidence shows that installed wiretaps have helped prevent violent terrorist acts, save numerous lives, prevent substantial economic losses and convict major organized crime leaders, drug traffickers and corrupt government officials.

Because Clipper provides excellent cryptographic protection on top of all the legal, procedural and technical safeguards, it should virtually eliminate all illegal wiretaps by the government or anyone else.

So, Clipper protects us from spies who want our secrets and from criminals who might otherwise use other encryption technology to evade law enforcement. If the government promoted an encryption standard that precluded lawful access, then criminals would surely flock to such technology as it became cheap and ubiquitous, with potentially disastrous consequences to society.

The government has rightly concluded that it would be irresponsible to promote a standard that would foil law enforcement and national security needs when those needs could be accommodated along with those for communications security and privacy. ■

SOUND OFF!

con CLIPPER

KATHERINE LAMBERT

CONTINUED FROM PAGE 105

and develop a data security policy that offers users the prospect of genuine security in electronic communications.

With Clipper, American citizens and businesses are asked to trust our privacy to a system whose design is kept secret by the National Security Agency (NSA), the country's supersecret international intelligence gatherers. This approach flies in the face of the accumulated wisdom in the computer industry that tells us that reliability and flexibility require open systems and open standards.

No business user would trust a mission-critical application to a piece of hardware or software that had not been subject to rigorous field-testing in the market and scrutiny by independent technical experts. Nor should a business user trust confidential personal information or valuable proprietary business communications to a system that has never been exposed to the rigors of independent testing.

In the case of Clipper, "independent review" consisted of handpicking five people to look over the chip behind closed doors after agreeing that much of what they learned would be kept secret.

Revelations of Clipper's flaws by an AT&T Bell Laboratories researcher demonstrate the dangers of foisting a closed, untested system on the American public. The researcher found that you can trick the chip into using a key that would not be accessible to law enforcement despite the escrow procedure.

This design error may or may not be possible to fix. But imagine what would happen if another bug is found five years from now and tens of millions of chips are installed across the country.

As communications needs span the globe, any viable communications privacy standard must be based on technology that can ultimately be adopted internationally. Even if Americans are duped into adopting this system, it is very hard to imagine foreign countries accepting it. After all, the algorithm is kept secret by the NSA, and our federal government locks away the keys.

> 'The potential for abuse or an accidental security breach is simply too great to tolerate.'

DANIEL WEITZNER

Above all, Clipper poses a grave threat to civil liberties and privacy by depositing all the keys to Americans' private communications with two federal bureaucracies that are largely unaccountable to the interests of private citizens.

The potential for abuse or an accidental security breach with tens or hundreds of millions of private keys in federal databases is too great to tolerate. A few corrupt officials, the perception of a national security crisis, even the machinations of a clever thief could cause improper disclosure of an entire key database.

Under the Fourth Amendment to the Constitution, law enforcement agencies can conduct "reasonable searches," including wiretaps and other electronic surveillance. The Clipper proposal takes the unprecedented step of guaranteeing that all wiretaps will be successful.

The final irony of the Clipper proposal is that it doesn't even solve some of law enforcement's basic problems. For instance, the FBI is legitimately worried that the proliferation of strong encryption will hinder its ability in some cases to do traditional wiretaps. But to believe that Clipper solves this problem requires us to believe that criminals who are smart enough to know they need communications security are at the same time dumb enough to buy the one device that says, in effect, "FBI Wiretap Ready" right on the box.

Our highest public policy priority should be to ensure all digital communications users access to high-quality security to protect themselves and their property from criminal invasion.

All of us who care about personal privacy and business security should send a clear message to the White House that Clipper fails to meet these needs. ■

As of press time, the Clipper controversy was heating up. The Clinton administration indicated Wednesday that it was willing to consider alternatives to the Clipper chip.

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Global REACH

by Alan Radding

Novell, Inc.'s NetWare 4.x promises to make the network administrator's job easier, but getting there will require a major reorientation. "You have to relearn everything you know about NetWare," says Scott Burch, staff Certified NetWare Engineer (CNE) at 900 Support, Inc. in Portland, Ore.

NetWare 4.x requires a fundamental change. "You have to think globally, not in terms of each server," Burch says.

Traditionally, NetWare administrators performed tasks on individual servers. But with NetWare 4.x, administrators must view the network as a single entity, not as a collection of individual servers, each associated with its own users, resources and applications. "Administrators get into trouble with [NetWare] 4.x when they think about people attaching to a particular server rather than to the network," Burch adds.

In the long run, the global approach should make life easier. Instead of rushing from one server to the next making adds, moves and changes, administrators will handle these tasks in one place, the NetWare Directory. If a user's access rights change, the change gets made once in the directory, not on every server the user can now access.

"Our goal is to increase the productivity of the network administrator," says Jim Greene, Novell NetWare 4.x product manager. That may well happen, but it requires mastering the NetWare Directory Services (NDS).

Changing how you think

"You must get out of the bindery frame of mind," Burch warns. The bindery is the server-specific directory used in NetWare 3.x. Where the bindery is one-dimensional and generally transparent, NDS is a complex, hierarchically structured directory tree. "The tree is the main thing. This is where your best people need to be," says Peter Cruikshank, Novell development leader at the Naval Surface War Center in Dahlgren, Va., which is in the process of upgrading 113 servers to 4.x.

Part of the change is dealing with new nomenclature. For example, "You have to understand the concept of 'context,'" notes Rick Troha, CNE at Network Support in North Olmstead, Ohio. Context is NetWare 4.x's term for the current directory level, in other words, where you are in the directory tree. Other new terms include container and leaf.

The new terminology can be confusing, Greene acknowledges, but Novell adopted it because it's the terminology used in the X.500 directory standard. "It would be even more confusing to use other terms," he adds.

While NDS represents a significant departure from past Novell practices, the concept of a hierarchical directory is something all NetWare administrators have probably encountered.

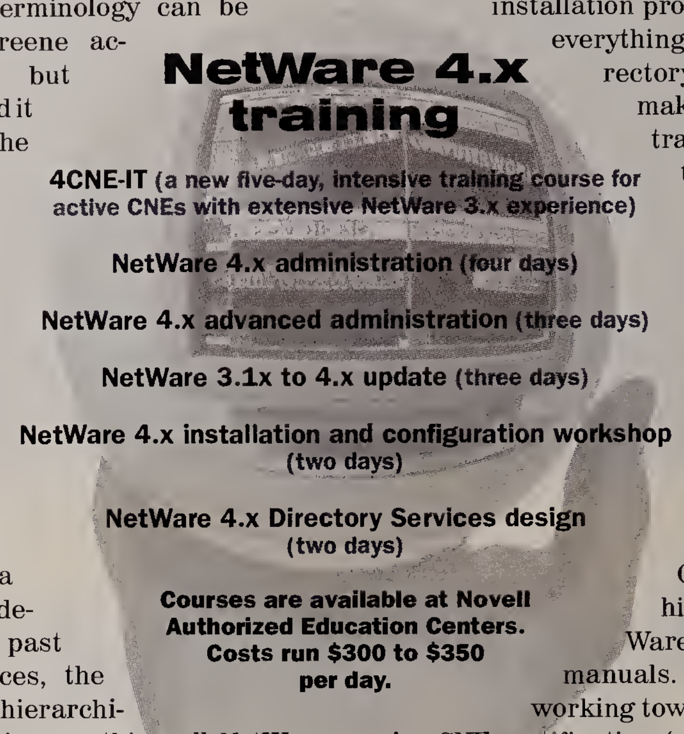
"Since DOS 2.0, people have been dealing with hierarchical directories," Greene explains. Instead of a file system, directories and subdirectories, the NetWare hierarchical directory deals with groups of users, organizations and organizational units. The terminology is different, but both still use a hierarchical, tree-like directory structure.

In an effort to ease the transition to the new directory, particularly for mid-size and smaller companies that don't have complex organizational structures, Novell is introducing a simplified directory installation process that puts everything into one directory level. "It will make NDS as transparent as the bindery," Greene promises.

NetWare administrators have followed a variety of paths to 4.x. Burch, an experienced CNE, taught himself NetWare 4.x from the manuals. Troha, who is working toward the Enterprise CNE certification (which requires 4.x skills), turned to Novell's computer-based training. Cruikshank, who participated in the 4.x beta program, took a Novell 3.x to 4.x migration class.

While there are relatively few NetWare administrators with 4.x training and experience, Cruikshank said he is optimistic about the impact of 4.x. "Every one of our [4.0-trained] people will be able to go out and name their own price." ■

Radding is a free-lance writer in Newton, Mass.



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USER EMPOWERMENT

by Daniel Lyons

When Domecq Importers, Inc. moved to a client/server architecture, something unexpected happened. Calls to the help desk at the Old Greenwich, Conn., liquor importer shot up. Although the new system empowered users to create their own reports using visual programming tools, they sometimes got in over their heads.

Still, the extra support burden was offset by the fact that requests for custom reports have all but disappeared, says Chief Information Officer Bob Cooke. And sending a support person to help a user for 15 minutes is much easier than assigning a developer.

"There's a trade-off," Cooke says. "You get more calls, but it's a lot easier to walk someone through how to customize a report than it is to have a programmer go through a development, troubleshooting and delivery cycle."

Armed and dangerous

Visual programming tools are supposed to make life easier for information systems staffers, and generally they do. But as Domecq can attest, visual tools can also cause new headaches as users start using products to do what amounts to simple programming.

Microsoft Corp.'s Visual Basic, for example, is handy for creating simple applications that connect or enhance various Windows applications such as Excel or Word. But while vendors tout ease of use, application requirements are often beyond normal user capabilities. "These are not hard-core programmers. They're users who are advanced enough to be dangerous, so to speak," says Mike Barlow, a principal member of the technical staff at Syntrex Technologies, Inc., a client/server integrator in Valley Forge, Pa.

NEED to know

Barlow says he and his colleagues often run into situations where a user has tried to customize an application, gotten lost and called IS to mop up the mess. "It's difficult to answer questions on an application that you know nothing about," he says.

The best advice to those rolling out systems that incorporate visual tools is to spend more time training users, says Robert Laudadio, project manager at Concept Information Systems, Inc., a client/server developer in Stamford, Conn.

"Why throw tools at users?" Laudadio says. "You're better off investing in training, educating them about how to use the applications, how to use the system."

Others say all the training in the world won't make up for these systems being inherently more precarious than host-based systems. Richard Finkelstein, president of Links Technology Corp., a client/server developer in Chicago, says visual tools can empower users, but they also make life difficult for IS.

"When you distribute processing you distribute problems. Instead of having problems centralized in one spot, you now have problems all over the place," Finkelstein says. "For example, you have users who get confused and wipe out data accidentally."

Users aren't the only ones who may have trouble. With products such as Powersoft Corp.'s PowerBuilder or KnowledgeWare, Inc.'s ObjectView, the learning curve can range from three months to a year. "It's not easy," says Doug Miller, director of the desktop business unit at Powersoft.

Perhaps the biggest challenge is that visual tools go hand-in-hand with joint application development (JAD), a methodology in which users review prototypes and help refine them. Cooperation between IS and users is not always easy.

"In the beginning it was tough," says Cooke, whose company "lives and dies" by JAD. "There was some resistance from IS people who felt, 'This is our world, don't tell us how to do our jobs.' But now we're handing off as much as possible to users. Their requirements have become much more sophisticated. They're really pushing our technological limits." ■

Lyons is a free-lance writer in Ann Arbor, Mich.

BRIDGING THE GAP

Kristin Temple works with developers at John Hancock Mutual Life Insurance Co. in Boston, reviewing prototypes of graphical user interface screens and designing system logic.

"I'm strictly an end user, not a programmer," Temple says. "I don't know how to program, but I work closely with the development team. When they design a window, I decide whether it works, do I hate the colors, do I hate where the buttons are, whatever."

Temple's job reflects John Hancock's emphasis on user input since the group began using visual programming tools. "Kristin is crucial," says Stephen Fagone, senior systems manager. "We work with her almost every day. I almost think of her as a part of my team."

But Temple is definitely not part of IS. "It's better that I'm still with the people who use the application day to day." Those people are the 100 customer service representatives who rely on the application — Customer Service Workbench.

Temple's title is Workbench Consultant. She oversees a staff of three: a life insurance expert, an annuities expert and a training consultant. Her most important role is writing specifications for new applications and helping programmers incorporate business rules into applications.

—Daniel Lyons

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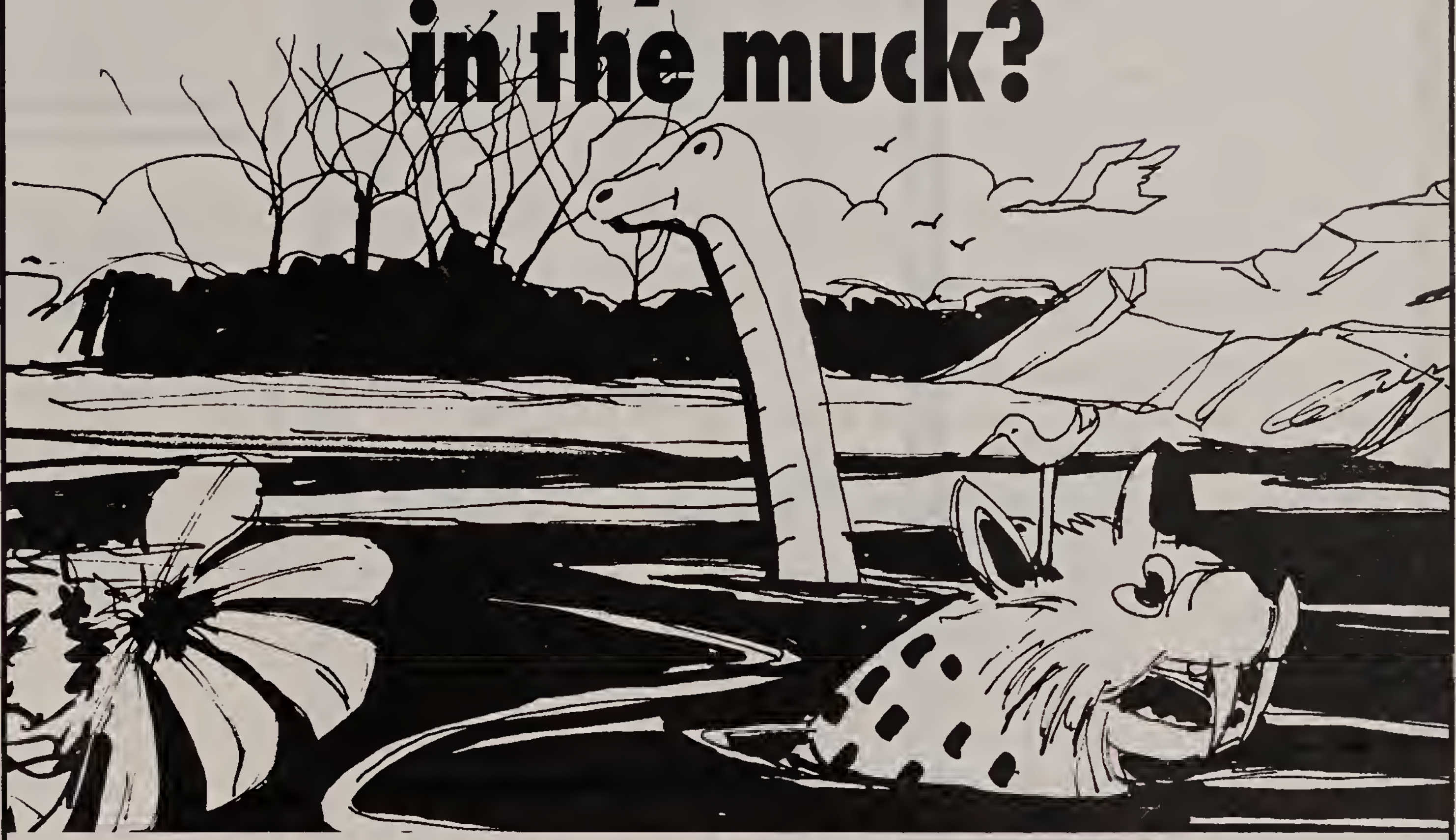

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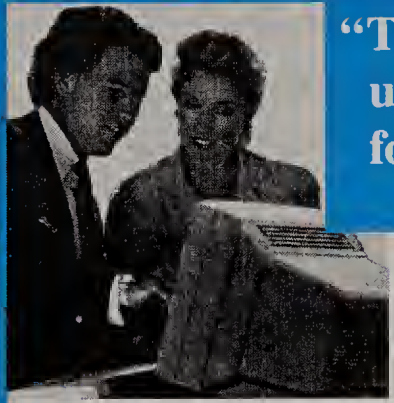

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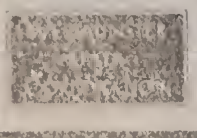

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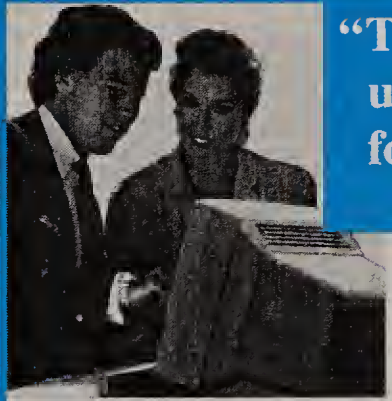

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PROGRAMMER ANALYST (Ref: 65194) to consult with clients to escertain & define their business requirements or problem areas & utilize technical expertise to provide solutions to clients' needs; analyze, design, develop & implement computer software for clients' EDP systems; enalyze, design, develop, implement & maintain a Under Writer Processing System on IBM hardware in MVS/XA; convert a tune existing system from IMS/DB, CICS, COBOL, VSAM, TELON to DB2, CICS, VSAM COBOL II, an application testing utilities such as INTERTEST, verify & endevour e change control facilities for an application & doing problem analysis & system tuning; Reqs. Bach. in Comp. Sci., Comp. Engineering, Electrical Engineering, Electronic Engineering, Systems Analysis or Its equiv. & 2 yrs. exp. in job offered or 2 yrs. related exp. as e Programmer, Systems Programmer, Programmer/Analyst, Systems Analyst, Software Engineer, Consultant, Analyst Programmer or Senior Programmer. Will eccept 3 yrs. college ed. plus 3 yrs. exp. in job offered or related occup. in lieu of req'd ed. & exp. Related exp. must include, in whole or part, analysis, design & development on IBM 3090 mainframe using CICS, VSAM, DB2 & COBOL II; $39,000/yr. 40 hr/wk., 8:30a-5p.

PROGRAMMER ANALYST (Ref: 57894) to consult with clients to escertain & define their business requirements or problem areas & utilize technical expertise to provide solutions to clients' needs; analyze, design, develop & implement computer software for clients' EDP systems; analyze, design & implement comprehensive North American Customs System; Systems analysis including deta flow & date modeling; system design & implement on IBM 3090 using MVS/ESA, IMS DB/DC & DB2; Reqs. Bach. in Comp. Sci., Comp. Engineering, Electrical Engineering, Electronic Engineering, Systems Analysis or its equiv. & 2 yrs. exp. in job offered or 2 yrs. related exp. as a Programmer, Systems Programmer, Progremmer/Analyst, Systems Analyst, Software Engineer, Consultant or Analyst/Programmer. Will accept 3 yrs. college ed. plus 3 yrs. exp. in job offered or related occup. in lieu of req'd ed. & exp. Related exp. must include, In whole or part, design, development & implementation of systems on IBM mainframe using IMS DB/DC & DB2/CICS; $40,000/yr. 40 hr/wk., 8:30a-5p.

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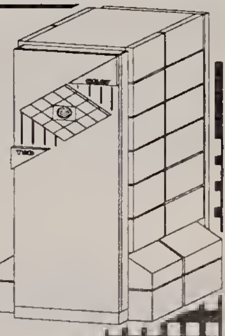

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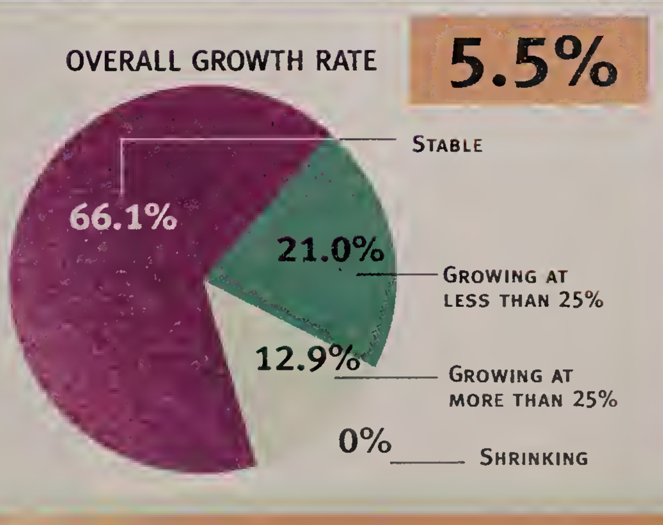

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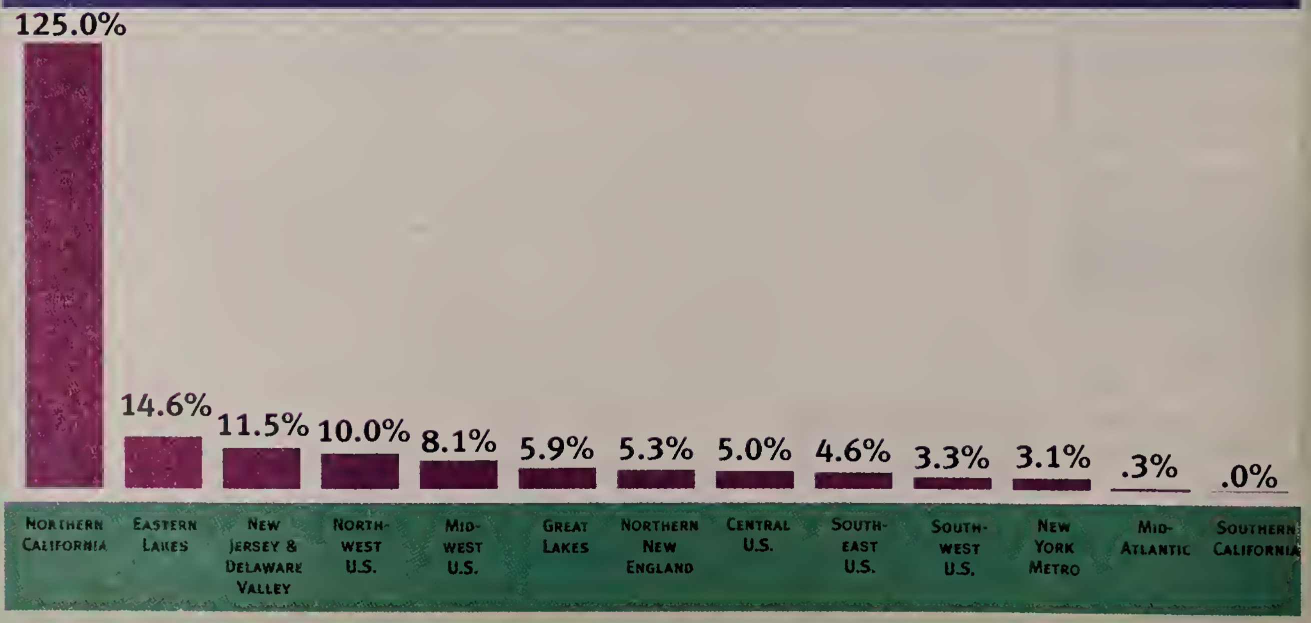

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Dangerous Liaisons

If you are farming out client/server development projects, choose your experts carefully

by

Julie Hart

Are you moving into a client/server environment? If so, plan to keep a tight rein on development, says Will Cate, manager of application programming at The Prudential Bank in Atlanta. "We've only outsourced one [client/server development] project, and it wasn't much of a success," he says.

In that case, one of the bank's departments directed an outside consultant without any hands-on involvement, Cate says. The result: a slow and cumbersome system.

"Every time [someone] asked for more features, the consultant gave them what they wanted," Cate says. "It ended up costing a lot, plus the system eventually became unusable because it was bogged down with too many features."

Without some hands-on intervention, the loss of application quality and integrity is inevitable. But this can be easily avoided. "If you need to get up to speed on client/server technology, hiring a consultant makes sense," says Ed Acly, director of software research at International Data Corp. in Framingham, Mass. "But when you bring someone in for a project of any magnitude, the customer must stay in charge."

For example, don't let the consultant set the project's objectives. Don't even call one until you have a clear idea of system requirements. And once development begins, a member of your technical staff should monitor its progress, frequently comparing it to initial specifications.

"If you let an outside consultant do the work for you, you still need to involve your people to make sure standards are adhered to and that the [project specifications] are interpreted properly," says Dick Lester, vice president of information systems at Associated Grocers, Inc. in Seattle.

Plus, your staff must know how the application is put together so they can make changes or solve problems later on. "No matter how good the outside contractor is, we need the knowledge to maintain whatever's built," Lester says. "That's why I think we're better off doing it ourselves."

In the family

The last time Associated Grocers hired a consultant it was for a client/server-based order-entry system. "The guy we hired used to work for us, so he knew our organization," Lester says. This was key to the project's success, he adds, since the consultant knew how the company did business as well as the individual managers' biases.

But that doesn't mean you should restrict yourself to in-house development or hiring past employees. "Client/server development is more complex than [development] for centralized systems, so ask for proof of [a consultant's] credentials," Acly says. "Check their references and make sure they've done a client/server project similar to yours." Companies overlook this, he says.

And expect to pay for their services. In the mainframe arena, consultants usually receive $50 to $60 per hour, Acly says. In the client/server arena, rates run between $80 and $90 per hour.

Hired gun

Although The Prudential Bank hasn't hired a consulting firm recently, it has hired contract programmers to pick up the slack. "Bringing in a hired gun that works as one of us works well," Cate says. "We get the extra help, yet we have full control over their efforts."

Even so, Cate says he isn't opposed to hiring another consultant as long as the circumstances are different. For example, if a user had a very detailed project that would save money or reduce head count, and information systems didn't have the resources, Cate might recommend farming it out.

In such an instance, someone from the technology group would oversee the project. "At the very least, we'd assign someone from our group to sit in at all the meetings," Cate says. This person would also be responsible for testing everything, ensuring that users' requirements and bank standards were met.

"You can't say to [a user], 'Here's XYZ consultancy firm. They'll develop what you need,' " Cate says. "We've seen what can go wrong if someone from our staff isn't in control."

If you decide to go it alone, without experience in client/server technology, "expect to spend 50% or more time in development," Acly says. "If the project runs into trouble, it will also run into a lot of money." ■

Hart is a free-lance writer in Sunnyvale, Calif.

Build or buy?

Top 5 client/server applications developed in-house:

1. Financial/accounting
2. Sales/marketing
3. Financial/management reporting
4. Manufacturing/operations/production
5. Distribution

Top 5 client/server applications bought from third parties:

1. Accounting
2. Human resources
3. Payroll
4. Order entry
5. Business modeling

Source: Business Research Group, Newton, Mass.

When to roll your own

"Unfortunately, there is no standard formula to determine when to hire a consultant or when to do the development work yourself," says **Shaku Atre**, president of Atre Associates in Port Chester, N.Y. If there's a certain window of opportunity to get a client/server application up and running, and you don't have the resources to do it, hiring a consultant may be your best bet.

But when making such a decision, intuition is your best resource, Atre says. "Intuition comes from experience. Good intuition comes from bad experiences," she says. So expect to make some mistakes along the way.

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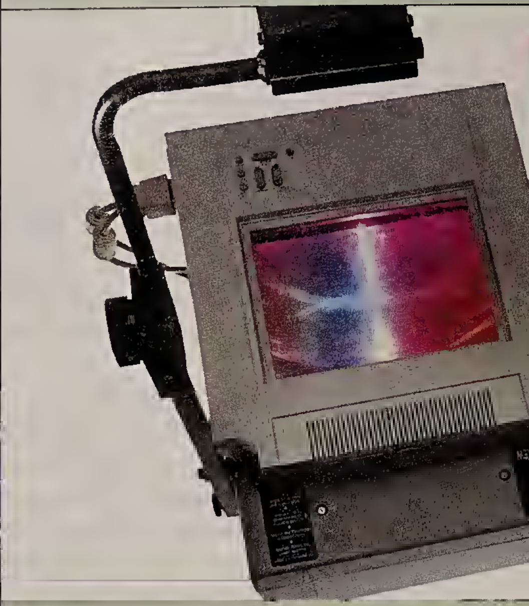

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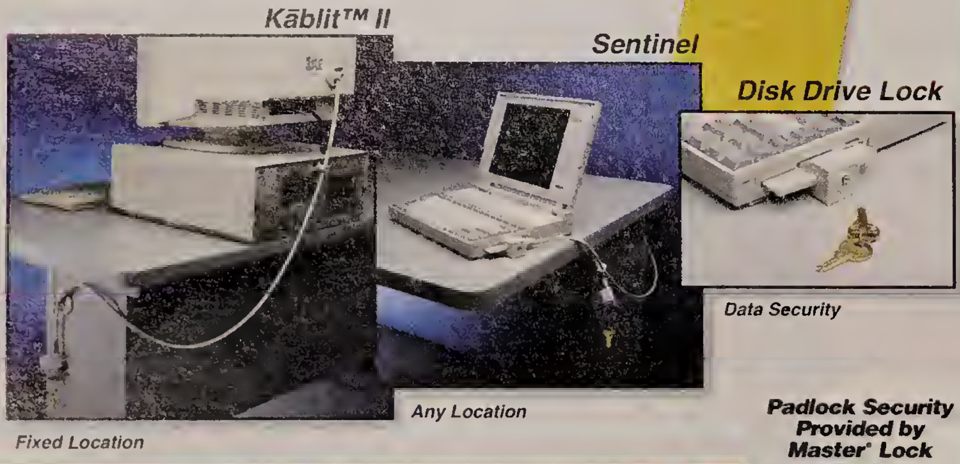

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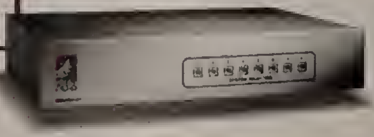

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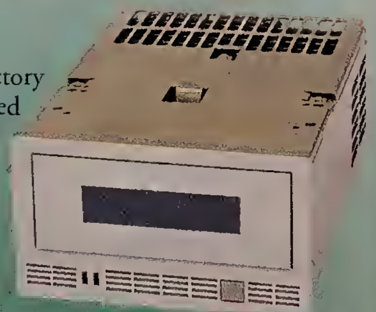

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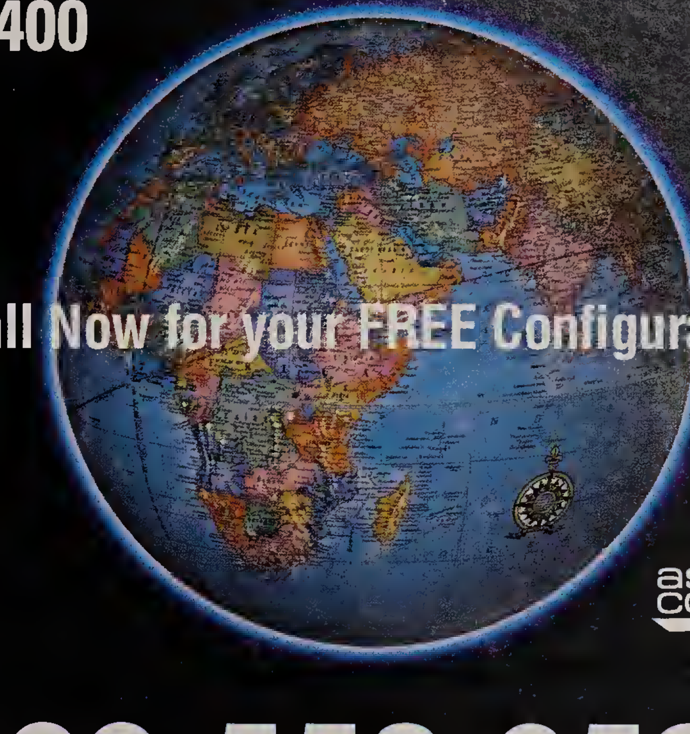

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CONTRACT # CMM-0945 Proposal Closing Date: Monday, August 29, 1994 at 4 PM local time.TITLE: Procurement Training and Documentation.SYNOPSIS: Consultant to update existing procurement policy manual; perform job task analysis, then write new procurement procedures manual with procurement documents supplement; create on-line reference system incorporating contents of manuals; create approximately twelve hours of interactive computer-based training lessons; recommend and purchase computer hardware/software to be used for implementation.

A Pre-proposal Conference is Scheduled for August 16, 1994, 2:00 P.M., at 130 Livingston Street, Conference Room 5 & 6, 6th Floor, Brooklyn, N.Y. 11201. Prospective bidders who desire to attend shall notify the Procurement Specialist no later than noon of the day prior to the scheduled event.

Sealed proposals will be received by the NYCTA at 130 Livingston Street, Brooklyn, New York 11201 at the Bid Solicitation Counter until the closing time and date. Proposals will be accepted until the stated closing data and time. There is a non-refundable $35.00 charge for each set of proposal documents. Payment can be made by company check or money order. No personal checks or cash will be accepted. Proposers will be fully responsible for the delivery of their bids in a timely manner. Reliance upon the U.S. Mail or other carriers is at the bidders risk. Late proposals will not be considered.

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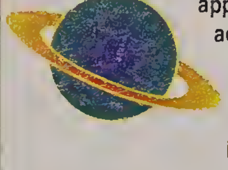

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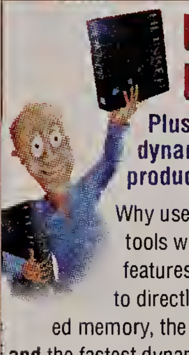

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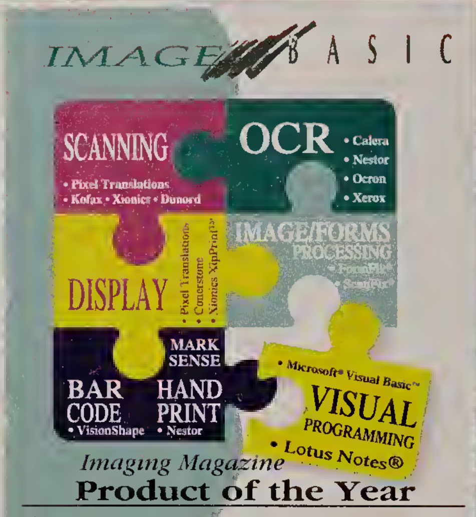

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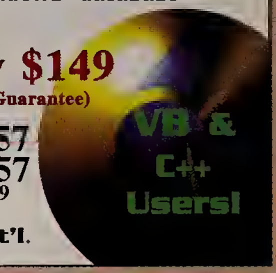

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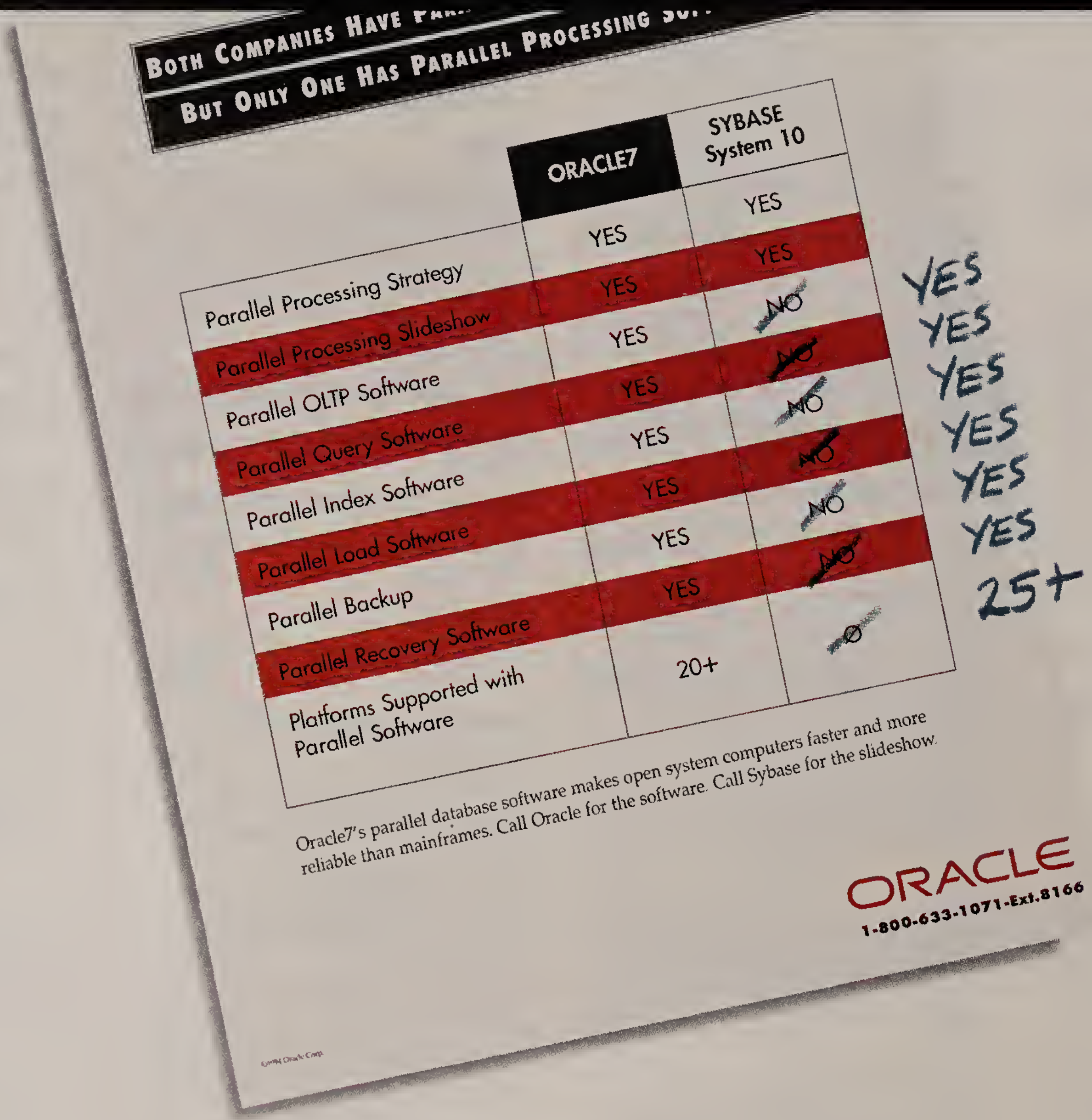

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Here's an enterprise-wide solution that lets you troubleshoot and repair your users' workstations directly from your server.

◆ ◆ ◆

Are you comfortable leaving data protection in the hands of your users? If not, Norton Utilities Administrator is the solution.

◆ ◆ ◆

Norton Utilities Administrator™ is a member of the Norton Network Series of products. Which means you can completely integrate it with Norton Administrator for Networks™ and control all your data protection utilities from one central console without ever leaving the friendly confines of your very own desk.

◆ ◆ ◆ ◆

Peter Norton pioneered desktop data protection. Now we're extending our expertise across your enterprise with Norton Utilities Administrator.

◆ ◆ ◆ ◆

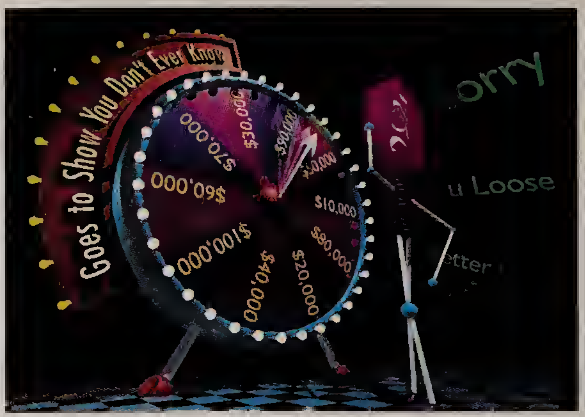
CENTRALLY MANAGED DATA PROTECTION ON EVERY USER'S DESKTOP.

All the safety, convenience and reliability of Norton Utilities recovery tools now run transparently on your users' machines while you monitor and control each one from your own desktop. Which means you have the ability to protect your data from the possibility of user damage.

Because Norton Utilities is centrally managed, all of your critical end-user system files are stored on your server for easy crash recovery.

Best of all, every single workstation on your network is actively being watched over. Kinda like a protective big brother.

In the interest of data integrity, our new Norton Disk Doctor Network Agent™ performs a battery of tests on each workstation's hard disk and data structures. This important step happens the instant users log-on to the network.



A 1992 study by IntelliQuest shows one in every four intensive PC users will experience a significant data loss – costing between $10,000 and $100,000 per incident. Care to let your users take a gamble?

◆ ◆ ◆ ◆ ◆

You can now diagnose and repair the data structures on all your hard drives and measure the fragmentation level of all your distributed data automatically.

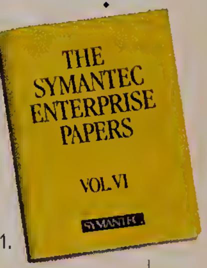
For even more efficiency, Norton Utilities Administrator keeps track of your workstations' histories and lets you proactively handle routine maintenance. It ensures that all your workstations are operating at peak performance, preventing downtime and the risk of data loss. So your entire network will operate at maximum efficiency.

Now you really can protect your users' data. Without having to worry about your users protecting themselves.

CALL 1-800-453-1135.

Ask for Extension 9B32 and request our White Paper: Reducing Network Administration Costs With Remote Workstation Recovery Tools.

White Paper available in U.S. only.
For more information in Canada, call 1-800-667-8661.



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MANAGING THE ENTERPRISE.

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Friday Stock Ticker

Gainers		Losers	
Percent			
Sequoia Systems Inc.	28.4	Intelligent Info. Systems	-36.4
IPL Systems Inc.	27.3	Wall Data Inc.	-23.0
ViewLogic Systems	21.4	Control Data Systems Inc.	-22.9
Hogan Systems Inc.	17.6	Lotus Development	-22.5
Optical Data Systems Inc.	13.2	Rainbow Technologies Inc.	-22.4
Apple Computer Inc.	11.7	Cirrus Logic	-19.9
Printronix Inc.(H)	11.6	Racotek Inc.(L)	-19.1
Gupta	11.2	Radius Inc.	-17.5
Dollar			
IBM	4.38	Wall Data Inc.	-10.25
Apple Computer Inc.	3.25	Lotus Development	-8.88
ViewLogic Systems	3.00	Sybase Inc.	-7.88
IMRS	2.25	Cirrus Logic	-6.50
Chipcom Corp.	2.13	Compaq Computer Corp.	-4.38
Paychex	2.00	Cabletron Systems	-4.13
Optical Data Systems Inc.	1.88	Powersoft	-4.13
ITT Corp.	1.63	Texas Instruments	-3.88

Industry Almanac

Aldus/Adobe gets thumbs-up

Although nervous investors initially had Wall Street frowning on the pending merger between **Aldus Corp. (ALDC)** and **Adobe Systems, Inc. (ADBE)**, analysts now say this match may be better than it first looked. In fact, they say it is hard to believe anyone had a problem with it.

"This is the first proactive merger we will have seen in a long while," said Michael Murphy, an analyst at Goldman, Sachs & Co. in New York. While **Novell, Inc. (NOVL)** and WordPerfect Corp. merged largely in response to Microsoft Corp.'s suite strategy, Aldus and Adobe face little competition in the desktop publishing software market and are joining purely because it makes good business sense, he said.

Although the value of the stock swap has dropped to an even 1-to-1 ratio as a result of last week's settlement with Altsys Corp. over Freehand, it is not worth fretting about, Murphy said. Freehand is a strong product, and Aldus simply is not worth as much without it. But take a look at the rest of Aldus' product line, combine it with Adobe's and you get a company worth half a billion dollars that has little or no competition in the growing multimedia market, he said.

Why the early doubts? Adobe investors who thought they would be stuck with a slow-growing company are partly to blame. "The problem with Aldus is that it spent a lot of money on research and development but wasn't managed aggressively enough to have much to show for it," Murphy said.

Still, Aldus and Adobe could take hold of the market, he said. They both have a solid base in bit-mapping tools — key to multimedia — and they will be under the direction of a chief executive officer who knows how to manage.

"John Warnock is probably the only guy smarter than Bill Gates," Murphy said. "They're going to be sitting square where the industry is moving with a great product line, tons of cash and a huge user base. It couldn't be better."

—*Erin Callaway*

Dynamic duo

With a combined 1993 worldwide market share of roughly 50%, Aldus and Adobe stand to grab a huge share of the desktop publishing market

	1993 Worldwide revenue	1993 Market share
Aldus PageMaker for Windows	$50M	19.3%
Aldus Photostyler for Windows	$23M	8.7%
Adobe Photoshop for Windows	$3M	1.2%
Adobe Illustrator for Windows	$14M	17.6%

Source: Dataquest, Inc., San Jose, Calif.

Communications and Network Services — OFF 0.56%

Exch	52-Week Range			July 22 3 PM	Wk Net Change	Wk Pct Change
OTC	63.75	19.63	3 COM Corp.	50.75	-2.63	-4.9
NYS	45.56	36.25	AMERITECH Corp.	39.50	0.75	1.9
NYS	64.88	49.50	AT&T	54.13	-0.13	-0.2
OTC	26.50	12.75	Banyan Systems Inc.	15.44	0.19	1.2
NYS	69.13	49.00	Bell Atlantic Corp.	55.25	-0.38	-0.7
NYS	63.88	53.00	Bellsouth Corp.	60.25	-0.63	-1.0
NYS	21.50	8.38	Bolt, Beranek & Newman	10.63	0.00	0.0
OTC	15.75	9.00	Brooktrout Technology	12.25	-0.50	-3.9
NYS	132.50	82.63	Cabletron Systems	102.38	-4.13	-3.9
OTC	43.00	15.00	Centigram Communications	16.19	-1.81	-10.1
OTC	60.25	31.50	Chipcom Corp.	46.25	2.13	4.8
OTC	40.75	18.75	Cisco Systems Inc. (L)	20.75	0.88	4.4
OTC	18.38	9.25	Compression Labs Inc.	12.13	0.88	7.8
OTC	12.38	5.13	Computer Network Tech. (L)	5.88	0.25	4.4
OTC	33.75	8.50	CrossComm	10.38	-0.63	-5.7
OTC	3.25	1.50	Data Switch Corp.	2.25	-0.31	-12.2
OTC	36.56	17.88	DSC Communications	24.06	1.19	5.2
NYS	17.63	8.25	General Datacomm Inds.	15.50	-0.63	-3.9
NYS	39.88	29.50	GTE Corp.	31.38	1.25	4.1
NYS	95.97	78.63	ITT Corp.	83.75	1.63	2.0
OTC	29.63	21.38	MCI Commmunications Corp.	23.75	0.81	3.5
OTC	7.75	1.50	Microcom Inc.	6.63	0.25	3.9
OTC	23.50	11.50	NetManage Inc.	16.25	0.50	3.2
OTC	7.25	3.50	Netrix Corp.	4.00	-0.50	-11.1
OTC	8.75	3.50	Network Computing Devices	4.13	0.38	10.0
NYS	11.13	7.00	Network Equipment Tech.	9.63	-0.38	-3.8
OTC	23.38	10.63	Network General	15.00	-1.63	-9.8
OTC	9.63	6.38	Network Systems Corp.	7.00	0.06	0.9
OTC	73.88	28.38	Newbridge Networks Corp.	40.38	-0.63	-1.5
NYS	33.75	21.38	Northern Telecom Ltd.	30.63	1.13	3.8
OTC	26.63	14.00	Novell Inc.	16.13	-0.50	-3.0
NYS	48.88	33.25	Nynex Corp.	38.00	0.13	0.3
OTC	30.00	15.50	Octel Communications Corp.	19.44	0.31	1.6
OTC	18.25	9.00	Optical Data Systems Inc.	16.13	1.88	13.2
OTC	7.50	3.25	Penril Data Comm Networks	3.63	0.00	0.0
OTC	20.75	10.00	Picturetel Corp.	13.00	1.00	8.3
OTC	8.25	2.75	Proteon Inc.	3.13	-0.25	-7.4
OTC	14.38	4.63	Racotek Inc. (L)	4.75	-1.13	-19.1
NYS	38.88	24.88	Scientific Atlanta Inc.	34.50	-0.50	-1.4
NYS	47.00	36.75	Southwestern Bell Corp.	43.00	-0.88	-2.0
NYS	40.25	31.38	Sprint Corp.	37.13	-0.25	-0.7
OTC	26.75	13.38	Standard Microsystems Corp.	14.63	-0.13	-0.8
OTC	29.50	11.50	Stratacom Inc. (H)	27.75	-0.50	-1.8
OTC	34.00	13.50	Synoptics Communications	14.50	-1.25	-7.9
OTC	15.25	2.88	Telebit Corp.	4.56	0.31	7.4
OTC	46.00	23.00	US Robotics	25.25	-3.13	-11.0
NYS	50.75	38.25	U S West Inc.	40.50	-1.50	-3.6
OTC	43.88	18.75	Wellfleet Communications	20.13	0.75	3.9
OTC	28.25	12.75	Xircom	15.25	-0.13	-0.8
OTC	23.00	12.75	Xylogics Inc.	19.25	0.00	0.0
OTC	30.00	11.25	Xyplex Inc.	16.13	1.13	7.5

PCs and Workstations — OFF 0.63%

Exch	52-Week Range			July 22 3 PM	Wk Net Change	Wk Pct Change
OTC	7.50	2.63	Advanced Logic Research	4.38	0.38	9.4
OTC	45.25	22.00	Apple Computer Inc.	31.00	3.25	11.7
OTC	33.00	12.50	AST Research Inc.	14.25	-1.00	-6.6
NYS	39.88	15.28	Compaq Computer Corp.	30.63	-4.38	-12.5
OTC	30.75	15.13	Dell Computer Corp.	26.00	-0.25	-1.0
OTC	25.00	9.25	Gateway 2000 Inc.	12.75	0.25	2.0
NYS	93.63	64.38	Hewlett Packard Co.	75.25	-0.75	-1.0
NYS	26.88	16.00	Silicon Graphics	21.25	-2.63	-11.0
OTC	31.38	18.25	Sun Microsystems Inc.	22.31	-0.44	-1.9
NYS	50.75	28.13	Tandy Corp.	36.38	1.38	3.9
OTC	5.13	2.38	Zeos International Ltd.	3.38	0.00	0.0

Large Systems — UP 1.02%

Exch	52-Week Range			July 22 3 PM	Wk Net Change	Wk Pct Change
ASE	7.88	4.38	Amdahl Corp.	6.25	0.38	6.4
NYS	7.63	3.63	Convex Computer	5.38	-0.63	-10.4
OTC	4.50	0.50	Cray Computer	0.94	0.06	7.1
NYS	33.75	19.13	Cray Research Inc.	21.38	-0.50	-2.3
NYS	10.75	6.63	Data General Corp.	8.13	0.13	1.6
NYS	43.13	18.25	Digital Equipment Corp.	19.50	-0.50	-2.5
OTC	6.38	2.38	Encore Computer Corp.	4.38	0.00	0.0
NYS	52.25	37.63	Harris Corp.	42.50	-0.75	-1.7
NYS	65.00	40.63	IBM	61.50	4.38	7.7
OTC	18.75	7.75	NetFrame	9.00	-1.00	-10.0
OTC	26.00	3.88	Parallan Computer	4.13	-0.06	-1.5
OTC	23.25	5.63	Pyramid Technology	5.63	-0.38	-6.3
OTC	20.00	11.13	Sequent Computer Sys.	13.00	0.00	0.0
OTC	6.84	1.75	Sequoia Systems Inc.	5.38	1.19	28.4
NYS	32.25	20.25	Stratus Computer Inc.	28.13	-1.00	-3.4
NYS	16.38	8.50	Tandem Computers Inc.	13.25	1.00	8.2
OTC	30.00	4.00	TriCord Systems	4.38	-0.13	-2.8
NYS	16.50	8.63	Unisys Corp.	8.88	0.00	0.0

Software — OFF 1.38%

Exch	52-Week Range			July 22 3 PM	Wk Net Change	Wk Pct Change
OTC	34.50	16.25	Adobe Systems Inc.	30.75	0.00	0.0
OTC	34.50	15.00	Aldus Corp.	30.13	0.13	0.4
OTC	8.38	4.50	American Software Inc.	4.75	0.25	5.6
OTC	15.75	6.75	Ask Computer Systems	13.13	-0.13	-0.9
OTC	61.75	37.00	Autodesk Inc.	52.00	-1.13	-2.1
OTC	4.25	2.00	Bachman Info. Systems	2.00	-0.13	-5.9
OTC	33.00	20.50	BGS Systems Inc.	25.00	1.00	4.2
OTC	71.00	41.75	BMC Software Inc.	44.75	-2.38	-5.0
OTC	30.75	22.50	Boole & Babbage	28.00	1.50	5.7
OTC	20.75	8.50	Borland Int'l Inc.	10.88	0.88	8.8
OTC	25.00	6.75	Brock Control Systems Inc.	8.00	0.38	4.9
OTC	4.63	2.38	CE Software	2.88	-0.38	-11.5
ASE	30.34	6.25	Cheyenne Software Inc.	8.13	-1.00	-11.0
OTC	14.25	7.38	Cognos Inc.	11.25	0.25	2.3
NYS	44.88	27.38	Computer Associates	40.50	-0.38	-0.9
NYS	5.38	2.13	Computervision Corp.	2.88	-0.13	-4.2
OTC	48.25	21.00	Compuware Corp.	39.00	-1.50	-3.7
OTC	14.00	7.25	Comshare Inc.	11.75	0.13	1.1
OTC	25.00	8.75	Corel Corp.	19.00	-1.00	-5.0
OTC	7.50	3.38	Easel Corp.	3.75	-0.25	-6.3
OTC	29.25	11.25	Filenet Corp.	18.63	-1.63	-8.0
OTC	25.00	3.13	4th Dimension	3.25	-0.38	-10.3
OTC	12.50	6.25	Frame Technology	10.13	0.50	5.2
OTC	13.00	7.00	Group I Software	8.25	0.25	3.1
OTC	31.75	6.75	Gupta	12.38	1.25	11.2
OTC	12.00	5.88	Hogan Systems Inc.	7.50	1.13	17.6
OTC	29.50	16.00	IMRS	24.75	2.25	10.0
OTC	44.75	12.50	Information Resources	13.75	-1.00	-6.8
OTC	24.50	14.25	Informix Corp.	20.50	0.88	4.5
OTC	12.38	8.50	Intergraph Corp.	9.75	-0.38	-3.7
OTC	8.75	2.88	Interleaf Inc.	3.00	0.13	4.3
OTC	15.50	4.75	Intersolv Inc.	10.25	-0.25	-2.4
OTC	50.00	27.00	Intuit Inc.	34.50	-3.50	-9.2
OTC	18.75	2.25	Knowledgeware Inc.	4.25	0.38	9.7
OTC	34.75	17.50	Legent Corp.	23.00	-0.25	-1.1
OTC	86.50	30.25	Lotus Development	30.63	-8.88	-22.5
OTC	18.00	6.25	Magic Software Enterprises	7.69	0.06	0.8
OTC	18.50	6.00	Manugistics Group Inc.	8.25	0.00	0.0
OTC	7.50	3.38	MathSoft	3.38	0.00	0.0
OTC	11.25	4.50	McAfee Associates	7.50	-0.50	-6.3
OTC	17.25	8.38	Mentor Graphics	10.88	0.75	7.4
OTC	30.25	11.50	Micro Focus	15.00	-0.50	-3.2
OTC	11.63	4.75	Micrografx Inc.	5.50	0.00	0.0
OTC	54.63	35.19	Microsoft Corp.	50.38	1.56	3.2
OTC	40.13	22.88	Oracle Corp. (H)	37.00	-2.00	-5.1
OTC	44.75	21.50	Parametric Technology	24.25	0.34	1.4
OTC	24.50	14.00	ParcPlace Systems Inc.	15.13	-1.88	-11.0
OTC	41.38	26.00	Peoplesoft	34.00	-0.75	-2.2
OTC	6.25	3.50	Phoenix Technologies	4.63	0.13	2.8
OTC	69.50	24.25	Powersoft	51.75	-4.13	-7.4
OTC	39.75	3.50	Platinum Software	6.50	-0.13	-1.9
OTC	15.50	7.25	Platinum Technology (H)	14.88	0.13	0.8
OTC	60.25	27.00	Progress Software Corp.	31.50	1.00	3.3
OTC	4.13	1.94	Quarterdeck Office Sys.	2.38	-0.19	-7.3
OTC	29.25	11.25	Rainbow Technologies Inc.	11.25	-3.25	-22.4
OTC	11.38	4.00	Rasterops	4.13	0.00	0.0
OTC	14.50	3.00	Ross Systems (L)	3.13	-0.06	-2.0
OTC	28.75	3.00	Sapiens Intl. Corp. N.V.	4.13	-0.25	-5.7
OTC	14.63	9.75	Softkey International Inc.	13.13	-0.06	-0.5
OTC	8.63	3.13	Software Publishing Corp. (L)	3.75	0.38	11.1
OTC	13.75	5.00	State of the Art	6.00	-0.50	-7.7
NYS	35.63	21.75	Sterling Software Inc.	30.25	-0.75	-2.4
OTC	21.63	6.88	Struct. Dynamics Research (L)	7.63	-0.13	-1.6
OTC	57.00	25.75	Sybase Inc.	39.75	-7.88	-16.5
OTC	20.50	9.88	Symantec Corp.	12.50	-0.13	-1.0
OTC	52.75	33.00	SynOpsys	38.50	1.25	3.4
OTC	24.25	11.75	System Software Assoc.	13.75	0.00	0.0
OTC	6.75	3.25	Trinzic Corp.	3.75	-0.25	-6.3
OTC	30.00	11.75	ViewLogic Systems	17.00	3.00	21.4
OTC	23.25	11.50	VMark Software Inc.	18.00	-0.25	-1.4
OTC	13.25	5.50	Walker Interactive Systems	6.88	0.13	1.9
OTC	60.00	23.50	Wall Data Inc.	34.25	-10.25	-23.0

Semiconductors — OFF 3.87%

Exch	52-Week Range			July 22 3 PM	Wk Net Change	Wk Pct Change
NYS	32.75	16.75	Advanced Micro Devices	25.63	0.25	1.0
NYS	31.25	19.38	Analog Devices Inc.	26.88	-3.13	-10.4
OTC	29.63	10.94	Atmel Corp.	23.50	-2.50	-9.6
OTC	7.50	3.63	Chips and Technologies	4.38	0.00	0.0
OTC	44.63	19.00	Cirrus Logic	26.13	-6.50	-19.9
NYS	19.88	11.25	Cypress Semiconductor Corp.	16.63	-1.25	-7.0
NYS	20.13	13.00	Dallas Semiconductor	15.00	-1.25	-7.7
OTC	27.75	14.75	Integrated Silicon Systems	19.00	0.25	1.3
OTC	74.50	51.50	Intel Corp.	57.75	-1.59	-2.7
NYS	29.50	13.00	LSI Logic Corp.	26.88	-0.13	-0.5
OTC	26.75	12.25	Lattice Semiconductor	18.50	0.50	2.8
NYS	40.50	15.16	Micron Technology	35.13	-1.50	-4.1
NYS	54.88	42.13	Motorola Inc.	49.50	0.75	1.5
NYS	25.00	14.38	National Semiconductor	16.38	-1.13	-6.4
OTC	10.13	6.75	Sierra Semiconductor	9.13	0.13	1.4
NYS	89.50	55.75	Texas Instruments	76.63	-3.88	-4.8
OTC	18.88	9.38	VLSI Technology	14.13	0.25	1.8
OTC	14.38	3.25	Weitek	3.50	-0.25	-6.7
ASE	20.38	3.75	Western Digital Corp.	14.13	-0.63	-4.2
OTC	59.75	29.00	Xilinx	32.75	0.25	0.8
OTC	40.75	23.75	Zilog Inc.	29.25	-2.50	-7.9

Peripherals and Subsystems — OFF 2.48%

Exch	52-Week Range			July 22 3 PM	Wk Net Change	Wk Pct Change
OTC	30.50	14.50	American Power Conversion	16.75	-1.50	-8.2
OTC	24.75	17.25	Banctec Inc.	20.38	-0.13	-0.6
OTC	7.75	3.25	Cambex Corp.	4.00	0.00	0.0
ASE	7.38	1.88	Cognitronics Corp.	3.00	0.19	6.7
NYS	20.50	9.00	Conner Peripherals	12.13	-0.75	-5.8
OTC	21.13	8.75	Creative Technologies Inc. (H)	21.00	0.75	3.7
OTC	15.25	4.75	Data Race Inc.	5.00	-0.75	-13.0
ASE	10.75	4.13	Dataram Corp.	4.63	-0.50	-9.8
NYS	23.00	11.81	EMC Corp.	14.88	-0.25	-1.7
OTC	8.25	3.13	Emulex Corp.	7.38	0.38	5.4
OTC	21.00	12.25	Evans & Sutherland (L)	12.25	-1.25	-9.3
OTC	22.50	8.25	Exabyte	14.63	-1.13	-7.1
OTC	34.00	3.50	Intelligent Info. Systems	3.50	-2.00	-36.4
OTC	4.38	2.00	Iomega Corp.	2.38	-0.13	-5.0
OTC	9.75	3.13	IPL Systems Inc.	4.38	0.94	27.3
OTC	28.50	13.75	Komag Inc.	21.25	0.50	2.4
OTC	8.63	4.25	Maxtor Corp.	4.88	-0.25	-4.9
OTC	8.75	4.88	Micropolis Corp.	5.38	-0.38	-6.5
OTC	22.50	10.00	Pinnacle Micro Inc.	15.25	-0.75	-4.7
OTC	13.25	6.25	Printronix Inc. (H)	13.25	1.38	11.6
NYS	11.75	6.88	QMS Inc.	8.00	0.75	10.3
OTC	20.25	9.38	Quantum Corp.	15.50	0.38	2.5
OTC	9.13	3.63	Radius Inc.	4.13	-0.88	-17.5
NYS	17.75	7.63	Recognition International (L)	8.00	0.00	0.0
OTC	6.88	3.63	Rexon Inc.	4.88	-0.88	-15.2
OTC	28.75	16.25	Seagate Technology	25.75	1.00	4.0
NYS	41.50	23.75	Storage Technology	37.38	0.38	1.0
NYS	33.38	21.38	Tektronix Inc.	31.38	0.13	0.4
NYS	104.88	69.88	Xerox Corp.	100.50	-1.50	-1.5

Services — OFF 1.64%

Exch	52-Week Range			July 22 3 PM	Wk Net Change	Wk Pct Change
OTC	25.50	15.00	American Mgmt. Systems	24.63	0.63	2.6
NYS	4.25	2.63	Anacomp Inc.	2.63	-0.13	-4.5
OTC	23.50	14.50	Analysts Int'l	15.00	-0.63	-4.0
NYS	56.88	47.63	Auto Data Processing	51.88	-1.63	-3.0
OTC	18.25	10.50	Cambridge Tech. Partners	17.00	1.00	6.3
NYS	27.13	14.75	Ceridian Corp.	24.50	-2.25	-8.4
NYS	24.25	14.00	Comdisco Inc.	19.25	0.13	0.7
OTC	12.50	5.66	Computer Horizons	10.50	0.00	0.0
NYS	45.25	27.25	Computer Sciences (H)	44.00	-0.63	-1.4
NYS	9.75	6.00	Computer Task Group	9.63	0.88	10.0
NYS	32.38	8.38	CompUSA Inc.	8.50	-0.38	-4.2
OTC	13.50	6.75	Control Data Systems Inc.	6.75	-2.00	-22.9
OTC	11.00	6.50	Egghead Discount Software	6.50	-0.25	-3.7
NYS	38.00	26.00	General Motors E (EDS)	34.00	-1.00	-2.9
OTC	22.75	7.50	Inacom Corp.	7.50	-0.25	-3.2
OTC	28.00	13.63	Intelligent Electronics (L)	14.88	0.38	2.6
OTC	22.50	8.00	Merisel	8.13	-0.38	-4.4
OTC	32.50	9.25	Microage Inc. (L)	10.00	0.13	1.3
OTC	40.50	27.16	Paychex	33.75	2.00	6.3
NYS	39.75	21.63	Policy Management Sys.	33.25	-0.75	-2.2
NYS	25.50	18.63	Reynolds and Reynolds	24.88	1.25	5.3
OTC	28.50	16.25	SEI Corp.	17.75	-0.50	-2.7
OTC	29.38	17.50	Shared Medical Systems	24.25	0.50	2.1
OTC	11.00	5.63	SHL Systemhouse	5.88	-0.06	-1.1
OTC	26.75	9.25	Software Spectrum Inc.	12.13	-1.50	-11.0
OTC	42.75	31.50	Sungard Data Systems	36.00	0.00	0.0

KEY: (H) = New annual high reached in period (L) = New annual low reached in period

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Pathworks loses

CONTINUED FROM PAGE 1

The company will probably keep Pathworks to give PC users access to the RS/6000s, but Yakerson added, "If I didn't have VMS would I buy Pathworks? Probably not."

The moves "are not an aberration," said Frank Dzubeck, an analyst at Communications Network Architects in Washington. "It's a direct result of users not knowing what Digital's real strategy is with respect to operating systems."

Windows NT is core to Digital's strategy, he said. At the same time, it supports OS/2 LAN Manager 2.2 under Pathworks (see story at right). "A lot of these accounts say, 'Why don't I just go over to [NT Server]?' It's one of the major operating systems, not a specialty piece," Dzubeck said.

Multiple factors

Users last week said their reasons for migrating ranged from cost, to a need for cross-company standardization, to a dislike or uncertainty about the product.

"We could save a substantial amount of money" by moving file and print services to NT Advanced Server, said Christopher Wiggins, senior systems analyst at Dow Corning in Carrollton, Ky. This is because the company, which now uses Pathworks 5.0, is moving file and print services from a VAX to an Intel-based box.

Moreover, "Pathworks seems to be the last thing people write applications for," said Al Kohli, staff officer of information systems development at the Canadian Air Command, which is standardizing on NetWare. He has encountered problems because some of the applications he needed did not run on Pathworks. "Incompatibilities like that were one of the main pushers" off Pathworks, he said.

Best seller

Pathworks' strategic importance for Digital is unclear. "It's one of the lead products in its client/server push," said Chris Christiansen, an analyst at International Data Corp. According to Digital, it is the company's No. 1-selling layered software product.

But "the software groups are in real limbo," Christiansen said. Digital said it would sell off pieces of its software and is expected to make its plans clear by the end of next month, he said.

Migration to Pathworks 5.0 is also not as fast as some analysts expected. "It's accelerating, but it's not aggressive yet," said Michael Hays, president of ITAC, a Pathworks consulting firm in Deering, N.H.

Part of the reason, analysts said, is the learning curve required. "Pathworks 4 and 5 are totally different. The only thing that stayed the same was the name of the product," Hays said.

And a good portion of users — Hays estimated 40% of those moving to Version 5.0 — consider the move to be good training for a future move to NT Advanced Server or NetWare 4.x.

'Coulda been a contender'

Observers last week predicted Digital will bow out as a competitor in the network operating system arena.

"We'll see less and less of Digital involved in a competitive stance," said Bob Sakakecney, an analyst at Aberdeen Group in Boston. Sakakeeney said he expects Digital to announce over the next six months specifics about how Pathworks will work with NT Advanced Server in multiple networking operating system environments.

Digital started that evolution last fall with Pathworks 5.0. That version was the first to provide services that could be purchased separately from the network operating system and work with other network operating systems including Novell's NetWare and NT Advanced Server.

For example, last week, Digital went a step further, saying it will no longer provide substantial upgrades to OS/2 LAN Manager 2.2. "We're switching our focus to the LAN Manager that is in NT Advanced Server," said Faye Allen, marketing manager for network operating systems at Digital.

Allen said Digital will complete enhancements already planned for OS/2 LAN Manager but that the focus will then shift to value-added services independent of the network operating system.

—Mary Brandel

Per-user pricing plans disappoint

CONTINUED FROM PAGE 1

simplify life, but that's only partially true," said Herb Edelstein, an analyst at Euclid Associates, a consulting firm in Potomac, Md.

Specifically, users should differentiate between concurrent and named users when negotiating database contracts, Edelstein said. Deals that allow a set number of generic users access to a given database are more flexible than contracts that sanction only specific user names and log-ons, he explained.

Concurrent-user deals would be ideal for many large sites where tracking precisely who is accessing a database at any given time is difficult, said Carl Esposito, president of the New York Oracle Users Group.

But even so, client/server setups that spread applications across several hardware and database platforms present their own problems, Esposito noted.

For example, consider the case of users running an Oracle application on one server but at times accessing information in tables stored in another copy of Oracle on another box. "Do those users need to be licensed for both databases?" Esposito asked. "And what if they access the second server only once a month or less?"

That fine print is crucial. For example, while Microsoft's SQL Server database pricing includes advanced features such as replication, Oracle's per-user pricing does not. Likewise, Oracle's per-user prices do not apply to add-on products that often are required for client/server systems such as the SQL Net communication tool.

"Per user or no per user, you still get hit on a lot of different fronts," said Jim Kent, manager of technology planning at the Vancouver Stock Exchange.

The exchange has been discussing contracts with both Sybase, Inc. and Oracle for a year. The vendors are willing to bargain, Kent said, but databases and related gateways, administration and other products will be the biggest single cost item in the exchange's technology budget. "I look at that, and I just choke."

Database prices on sample configurations

	Digital VAX/VMS server with 250 users	HP 9000 Series 800 server with 100 users	Windows NT-based server with 50 users
Informix*	Not supported	$120,000	Not supported
Microsoft	Not supported	Not supported	$7,995
Oracle	$100,000	$80,000	$22,500

*Informix-OnLine database, not Informix-SE product

Meanwhile, Sybase SQL Server database users have yet to see their vendor make any significant pricing shifts. Although Oracle's new prices "aren't terribly aggressive . . . Sybase wouldn't be competitive" with them, said Bill Shattuck, an analyst at Montgomery Securities, a brokerage in San Francisco.

Sybase adheres to traditional database pricing that weighs platform, operating system and number of users. Sybase will not change that scheme in the near term, officials said.

D&B will integrate Pilot into SmartStream

By Rosemary Cafasso

On the heels of Dun & Bradstreet Corp.'s acquisition of Pilot Software, Inc. last week, Dun & Bradstreet Software confirmed that it will likely integrate the Pilot business analysis tools into its SmartStream client/server application set.

While D&B does not dictate product plans to its business units, it is suggesting that its various companies consider integrating Pilot technology into their product lines, said Dennis Sisco, a senior vice president at the parent company.

Sisco did not identify specific business units, but industry analysts speculated that D&B unit A. C. Neilson, the market research firm, could use the Pilot technology to deliver its consumer information. Other D&B companies include Dun & Bradstreet Information Services, Moody's Investors Service, Inc. and IMS International, Inc., a medical information services company.

The Pilot move could be a good one for SmartStream users because it will give them more options for high-level business analysis tools. SmartStream includes the Decision Support System (DSS) application, which provides basic query and report-generation functions, but it is not considered high-level software like an executive information system (EIS), nor does the base product have top-end capabilities such as multidimensional data analysis.

"Bringing in more focused products can only be good," said Doug Gosling, manager of financial systems at Hydro-Quebec, which uses SmartStream DSS. Gosling said his staff eventually plans to deploy an EIS and would consider looking at the Pilot technology.

But adding Pilot to the SmartStream mix could also strain D&B Software's relationship with Cognos, Inc., a Pilot competitor. D&B Software has been providing Cognos Powerplay as a SmartStream data analysis tool set and last week said it will continue to do so.

Doug Bayer, director of SmartStream DSS technology, said he expects the Pilot and Cognos products to complement each other because the Pilot offering can provide the most "industrial strength" data analysis capabilities. The Cognos tool set, on the other hand, addresses the middle tier of users who do not require the most heavy-duty system but still need sophisticated data analysis tools.

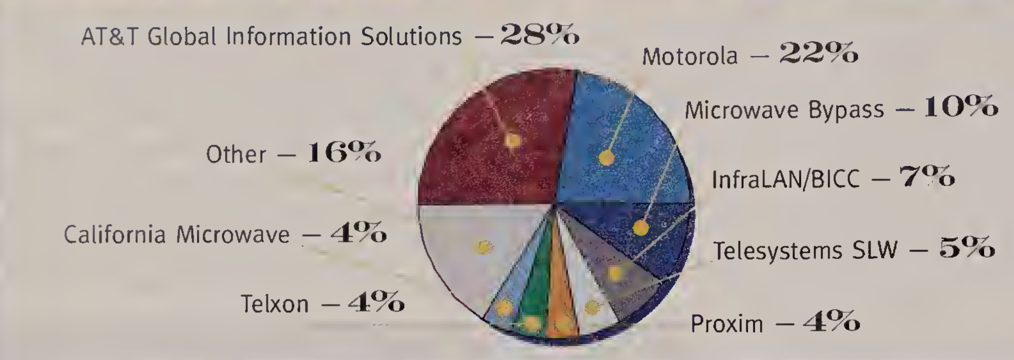
Cognos, however, seemed less enthusiastic about such an arrangement last week, although Neal Hill, vice president of corporate marketing, said he had no indication that there would be any change in the D&B/Cognos relationship.

Bayer said plans for Pilot technology will not throw off the current delivery schedule for SmartStream DSS. Release 2.1 shipped just last week, and Release 3.0 is on target for November, he said.

INDUSTRY PULSE: Wireless LANs

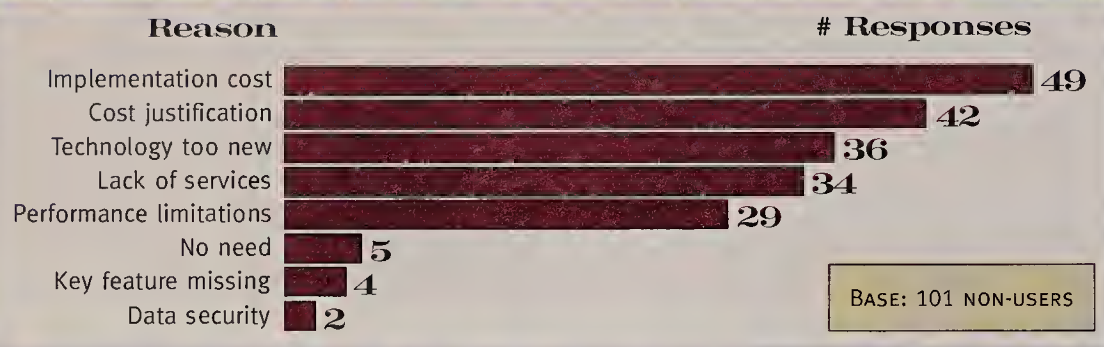
THE WIRELESS LAN MARKET EMERGED IN 1990. AT&T GLOBAL INFORMATION SOLUTIONS AND MOTOROLA ENTERED IT EARLY AND ARE THE CURRENT LEADERS OF THE $60M MARKET

1993 U.S. wireless LAN market share

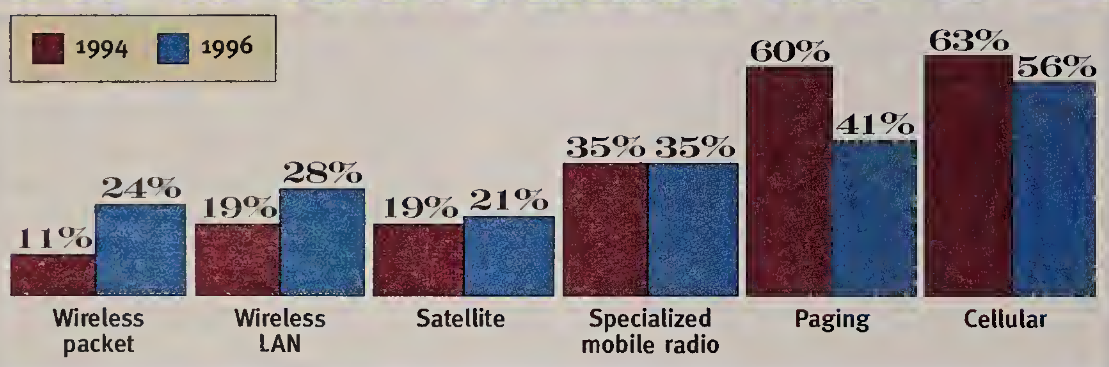


THE COST OF WIRELESS LANS IS EXPECTED TO BECOME COMPARABLE TO WIRED LANS IN THE NEAR FUTURE. THE TOTAL COST JUSTIFICATION FOR WIRELESS LANS SHOULD INCLUDE THE INCURRED COST OF WIRELESS ADAPTERS, THE AVOIDED COST OF WIRING, MOVING AND REWIRING AND THE BENEFITS OF MOBILITY

Barriers to wireless data implementation



80 current users voice their planned use of wireless technology



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How to contact *Computerworld* editors:

	PHONE:	FAX:
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24-hour tip line	(508) 820-8555	
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Inside Lines

Much ado about nothing

Sources at Cabletron were telling reporters last week they heard that problems with SynOptics' ATM chip set allegedly required the chips to be sent back to Washington University to be fixed. One even went so far as to say this would hurt SynOptics because "it wasn't currently shipping any ATM products." According to SynOptics, there are no problems with its chip set, Washington State did not design or manufacture them, and it has been shipping its LattisCell ATM switch for roughly a year.

Software for sale — or not?

Digital doesn't deny that it's reviewing its software products for areas to divest. But if it doesn't pick up the telephone, then how will it ever make a deal? "I've had friends try to buy pieces," one industry analyst said last week. "But they can't even get a returned phone call. If you're calling into the groups to investigate procurement, that's not the way to do it. You've got to go around them."

The object of Candle's desire

Industry sources said Candle has been working with Microsoft to solve the problem of interoperability between Microsoft's OLE and Object Management Group (OMG)'s CORBA. The resulting technology exists as a layer in Omegamon, Candle's systems management software, which will be demonstrated on Microsoft's Windows NT at this week's Object World. The sources said OMG is expected to request technology for solving the OLE-to-CORBA problem next month at its Dublin meeting, and Candle and Microsoft are likely to separate this technology and offer it as an option.

DCA climbs on the groupware wagon

Digital Communications next week will announce a client/server groupware application that will let users within a company work collaboratively. The application, which will let users share graphics, though not voice and video, offers a graphical user interface and the ability to do full-text searches and call in from remote sites.

Smells like...

It looks like it may be fish-or-cut-bait time for one longtime OS/2 supporter. If Describe can't sell at least 1,000 copies of its soon-to-be released word processor in the first 30 days of availability, the company said it will drop the product. Describe delivered some OS/2 applications a few years ago but has reportedly received little return on its longtime investment.

Give me more, give me more

A three-year plan showing relatively flat unit shipments for the AS/400 did not bring a smile to the face of IBM Chairman Louis V. Gerstner. After a presentation a few weeks back, Gerstner gave the AS/400 Division 60 days to put together a revised version with higher shipment targets, acknowledged Frank Soltis, senior engineer and architect of the midrange system. Gerstner is an acknowledged AS/400 fan and thinks IBM should be able to do better with the machine, especially after promised PowerPC-based versions ship during 1995, analysts said.

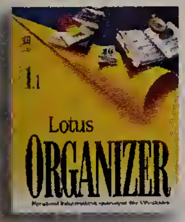
Hold your breath

One of the most conspicuously absent pieces of native software for Apple's Power Macintosh may soon become available. Microsoft this week plans to commit pricing and an availability date for the Power Macintosh version of its Microsoft Office suite of word processing, spreadsheet and presentation software.

Oops! An employee at Communications Intelligence Corp. committed a classic Freudian slip last week. After explaining to a reporter why the company's Chapter 11 status won't last long, he then said, "So, where should I fax the resume? I mean, release?" If you have anything you'd like to send us, Computerworld*'s 24-hour voice-mail tip line is (508) 820-8555; our toll-free number is (800) 343-6474. News Editor Maryfran Johnson can be reached by phone at (508) 820-8179, via Internet at mjohnson@cw.com or through MCI Mail at 590-8017.*

BLACK HOLE (ARTIST'S CONCEPTION)

"THIS MEETING WAS SUPPOSED TO START A HALF HOUR AGO. WHERE IS EVERYBODY?"



It's a known fact. Busy schedules and poor communication can create black holes that suck up co-workers just before the big meeting. Scientists can tell us a lot about black holes, but they can't get people together on time. Only Organizer™ can do that.

Lotus® Organizer 1.1 Personal Information Manager for Windows™ works across your existing cc:Mail® network to make scheduling a meeting–as well as planning your day–easier than ever.

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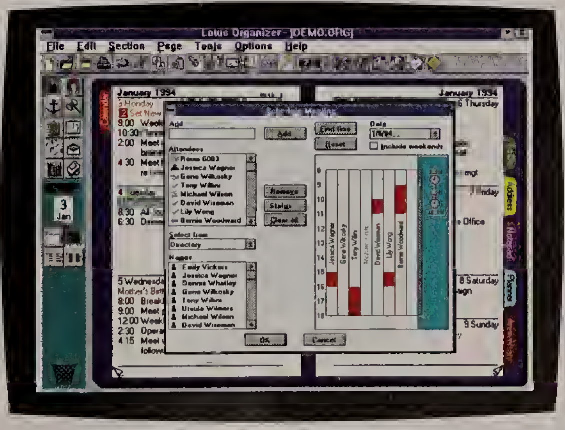
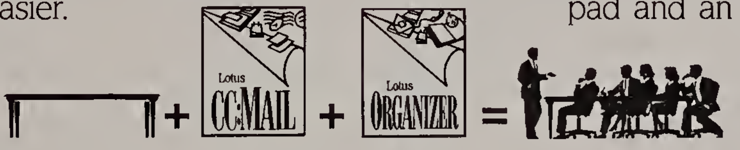

Lotus Organizer - [DEMO.ORG]
File Edit Section Page Tools Options Help

Lotus Organizer with group scheduling takes the guesswork–and the footwork–out of meeting planning.

And for cc:Mail LAN Administrators, no solution could be easier. Organizer uses the existing cc:Mail directory to simplify installation. Invitations can go to anyone on the network, even if they don't use Organizer. The group scheduler displays a user's *availability only*, not the entire schedule, so security and privacy are protected. And because both Organizer and cc:Mail have exceptionally friendly user interfaces, you receive fewer help calls and your life is made a little easier.



Organizer does more than plan meetings. Organizer includes an on-screen calendar, an automated to-do list, an address book, a note pad and an anniversary reminder. Organizer will even sound an alarm to remind you of a commitment–like that meeting you're invited to.

Now there are three ways you can get Organizer: on its own; with cc:Mail in the 10-user Group Pack™; or for an even better deal, upgrade to SmartSuite®– a suite of five top-notch, fully integrated business applications, including Organizer– for just $299.* Call **1-800-872-3387, ext. 9922.** or visit your Lotus Authorized Reseller. Because, as common as they are, black holes at work are now entirely preventable.

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CUSTOMER ALERT

dBASE users discover FoxPro 2.6 falls short

“FoxPro 2.6 fell well short of the claim in [Microsoft] ads that ‘the unique AutoMigrate feature lets you move your existing dBASE files effortlessly into FoxPro.’”

“The simplest crash was triggered just two keystrokes into the program.”

“Microsoft officials reported that the problem was that FoxPro is unable to handle certain dBASE statements.”

“When we attempted to migrate our art gallery management system to FoxPro, the whole process was frustrating.”

“Our tests turned up a surprising number of bugs, errors and crashes involving these new features...”

“This reviewer, a dBASE user and programmer, tried unsuccessfully to “AutoMigrate” the target application rather than performing the relatively laborious task of learning a complex new software platform. In the end however, that is what FoxPro 2.6 required.”

“FoxPro for Windows crashed several times when generating a project involving dBASE code.”

“Besides these compatibility shortcomings, there are also design flaws that make 2.6 unsuitable for a tentative user.”

PC WEEK review exposes compatibility flaws
May 16, 1994

The closer dBASE® for Windows gets to shipping, the more Microsoft seems compelled to cover FoxPro compatibility flaws with untrue marketing claims. Perhaps they've seen how easy dBASE for Windows makes it for all developers to create great Windows database applications using their existing knowledge of dBASE. Perhaps they've seen how naturally applications created with dBASE for Windows can be upsized to client/server applications. Perhaps they've seen how its new “Plug-and-Play” Architecture makes dBASE for Windows totally open to work with your favorite tools and important local and SQL data.

Whatever the case, reacting by claiming that FoxPro addresses dBASE customer's needs is irresponsible. But don't take our word for it. Read the May 16th *PC WEEK* review for yourself.

Build your database strategy on superior technology, not marketing hype

Visual design tools, full use of Windows, reusable object-oriented code, and seamless compatibility are what you've asked for. And that's exactly what you get in dBASE for Windows. dBASE will set the standard for data management and database application development for a long time to come. We know because our customers who have tested beta versions of dBASE for Windows are telling us, “thanks for taking the time to make it right.” Borland has been the leader in the database market for many years. And if there's one thing we understand, it's that when it comes to your data, it has to work right the first time. dBASE for Windows is your best path from DOS to Windows and client/server.

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